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AUGUST 1935 VOL. 91, No. 8

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THE VETERINARY JOURNAL

A MONTHLY REVIEW OF VETERINARY SCIENCE

Est. 1828

EDITOR:

PROF. SIR FREDERICK HOBDAY, C.M.G., F.R.C.V.S., F.R.S.E.

DR. MED. VET. h.c. (ZURICH),
HONORARY VETERINARY SURGEON TO HIS MAJESTY THE KING,
OFFICIER DU MÉRITE AGRICOLE (FRANCE),
CAVALIERE DEI SS. MAURIZIO E LAZZARO (ITALY),
HONORARY MEMBER OF THE AMERICAN VETERINARY ASSOCIATION,
PRINCIPAL AND DEAN OF THE ROYAL VETERINARY COLLEGE, LONDON.

SUB-EDITOR:

GLADSTONE MAYALL, M.R.C.V.S.

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The Veterinary Journal.

AUGUST, 1935.

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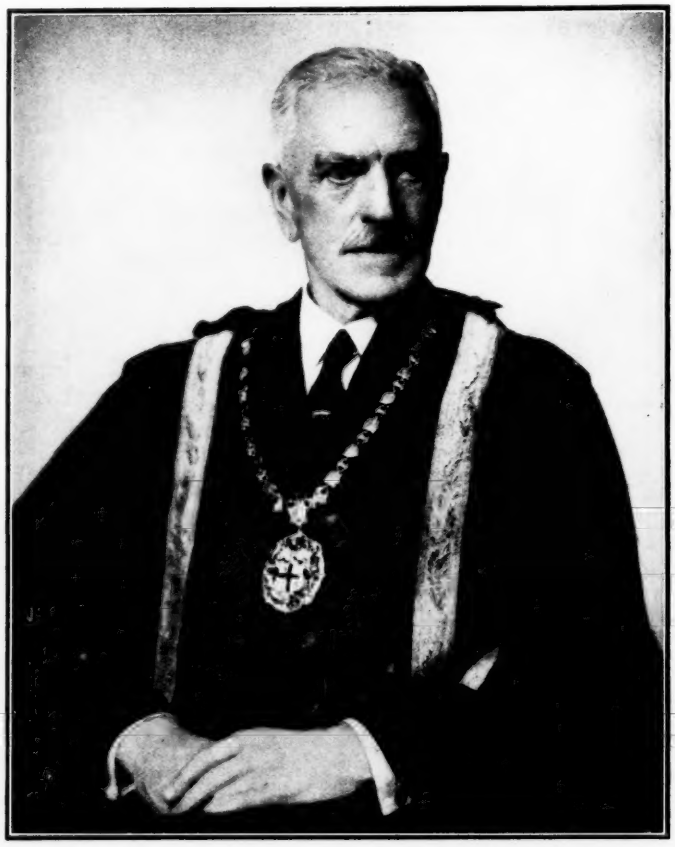

Mr. JOHN M. MCINTOSH, M.R.C.V.S., F.R.S.E.

The newly-elected President of the Royal College of Veterinary Surgeons.

THE
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AUGUST, 1935.

Biography

MR. JOHN M. McINTOSH, M.R.C.V.S., F.R.S.E.

THE selection of Mr. John McIntosh for the Presidential Chair of the Royal College of Veterinary Surgeons, from which he will rule over the destinies of the veterinary profession, was acclaimed by every member of the Council of the Royal College; and those who have the privilege of his friendship know that for a year at any rate the members may settle down—each to his own task—in the firm knowledge that no detail will be too small to be thoroughly considered, and no duty will be too onerous to be left undone. Retiring from an active professional life, it was to be expected that John McIntosh could not rest idle, and it is a fortunate chance, and most opportune, that his election as President should occur at this present busy time. His year of office as President of the National Veterinary Medical Association has given him some idea of the duties of the work implied by the occupier of a Presidential Chair, and the one will have been a most excellent training ground for the other. That his year of Office may be a pleasant one is the wish of all readers of THE VETERINARY JOURNAL.

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Editorial

THE "ONE PORTAL" SYSTEM.

In a further column we draw the attention of our readers to a discussion on the above subject which took place at the recent annual representative meeting of the British Medical Association, in which dissatisfaction was expressed at the variability of the standards of the numerous respective entrances into the medical profession ; an investigation having showed that the percentage of passes of the final examination varied as much as from fifty in one case to eighty in another.

Opinions varied as to the advisability of adopting any such method as a "one portal" system in medicine ; and perhaps, owing to the large numbers of graduates needed, and the variety of work to be done in the realm of medicine, there is a great deal to be said in favour of a continuance of the one in vogue at present ; but, in so far as the Veterinary branch of Medicine is concerned, its Council, and, indeed, the whole body of its members, plump solid for its " one portal " system.

CANINE HYSTERIA IN THE ARCTIC REGIONS.

We reprint in this issue an extremely valuable article from *Skandinavisk-Tidschrift* on " Arctic Nervous Diseases," by J. Baashuus-Jessen, who is a veterinarian and the registrar of the State Studbook for Norway. The author gives a compilation of the literature on nervous diseases of wild animals and dogs in the Arctic. He covers about 400 works in all, and takes his information from accounts of Polar expeditions and from works on veterinary and human medicine, physiology and zoology. The object aimed at was to throw some light on the problems connected with arctic hysteria. He considers that the factors causing hysteria are especially malnutrition ; and, first and foremost, loss of body heat. It is recommended to feed mink and marten with living mice. Silver foxes died with paralysis or convulsions, whereas among Eskimo dogs a disease much resembling rabies often occurs. The symptoms in both dogs and foxes declined after receiving food rich in fat. The arctic disease " piblokto," in Eskimos, the tendency to gnaw in Manchurian ponies, and the symptoms of scurvy in Polar travellers, were in the main deficiency diseases, and not the mute form of rabies. True rabies does not occur in Greenland dogs, and the disease here alluded to is not incurable.

Peary had bad results from feeding his dogs on pork, whereas he attained good results on sliced walrus meat given with hide and blubber included. As curative remedies, calcium compounds combined with sedatives ought to be tried, and later cod-liver-oil. The Cape York disease " piblokto " (furious, mad or running

amok), in the view of the author, is identical with the English "canine hysteria." Seal meat was a preventative of scurvy and tuberculosis, and the ingestion of fresh blood caused a rapid change for the better, even when deranged mentality was present. Amundsen considered that scurvy and madness went together, and where the member of a sledge party lost consciousness a complete change for the better took place after dosings with the blood of an ice bear. In the Eskimo dog disease the best treatment seemed to be 5 grams of calomel followed by croton oil. Amundsen relates of his dogs that " too late, unhappily, I came to the conclusion that it was probably lack of fatty matter in their food that killed them, for they soon changed for the better after giving stock fish, maize meal and ample margarine, mixed and boiled together. Malnutrition on long voyages and secondly loss of heat from cold winds, rains, squalls and wet objects caused many of the dogs to arrive at debarkation in a bad state of body and nerves, but most of them recovered under the soothing influence of the ' flesh pots ' of the Antarctic." This confirms what has also been observed in outbreaks of hysteria amongst dogs in Great Britain.

These wise words quoted from the end of the pamphlet are worth setting down : " Dogs attacked by the alleged rabies may be handled between the flurries if a man is very slow in his motions ; a quick movement of any kind seems to throw them into paroxysms of attack." The author concludes with : " I know of no department of psychology which at present promises such rich reward to the investigator as that relating to the physiology and pathology of mind in the lower animals."

DR. GRIFFITH EVANS, CENTENARIAN, "AT HOME."

AN APPRECIATION BY SIR FREDERICK HOBDAY, C.M.G., F.R.C.V.S.

OUR distinguished colleague, Dr. Griffith Evans, " held court " at his home, Brynkynallt, Bangor, on Wednesday, August 7th, at 11 a.m., the occasion being the celebration of his 100th birthday; having previously, at a much earlier hour, received the personal congratulations of his family. He is, indeed, a wonderful man, for he was literally " as fresh as a daisy," although he had, at his own request, on the previous evening, after the arrival of the London train, received his two veterinary colleagues—Capt. Savage and Sir Frederick Hobday—and the interview was of such mutual interest that the midnight hour struck before the lapse of time was noticed.

It was difficult to find a veterinary subject on which Dr. Evans was not *au fait*, and his grasp of modern every-day subjects would put many of our present-day graduates " in the shade " ; whilst the accurate recollections of " men and things " of sixty, and even eighty, years ago were astounding. Although through the bad luck of two very severe accidents, involving fracture of each thigh, bedridden and very deaf, his mental faculties are almost perfect: so much so that there was not the slightest difficulty in maintaining an interchange of ideas and questions by means of a writing pad and pencil.

In accordance with his own request the presentation from his *Alma Mater* was to be the first (after the private congratulations of his own family) of the series of the ceremonies which had been arranged to do him honour and give him pleasure on attaining his centenary; and the quiet delight of our revered friend was a reward to his daughter (Dr. Erie Evans), and those whose privilege it was to be allowed to be present.

An account of the various addresses and telegrams of congratulations is given below; and when at the finish we bade him "good-bye," it was with a feeling of wonderment at the virility of this superman.

The Presentation Ceremony.

Amongst those present were Capt. W. H. Savage, M.R.C.V.S. (in private practice in Bangor) and Mr. W. T. Rowlands, M.R.C.V.S., D.V.S.M. (from Bangor University), of the veterinary profession; and the following members of his family: Dr. Erie Evans and Mrs. Garfitt (daughters), Miss Garfitt (niece), Mr. G. H. Jones, Registrar of the University of Bangor, and Mrs. Jones (son-in-law and daughter), Mr. Evans (son), Mr. Bevan Jones (grandson), and Mr. McDermid (representing the Press), with several other relatives and intimate friends.

Professor Sir Frederick Hobday, in presenting the Congratulatory Scroll, said:

" Dr. Griffith Evans,

" I have come to Bangor specially to present you with this scroll signed by H.R.H. Prince Henry, Duke of Gloucester, the President of the Royal Veterinary College—your *Alma Mater*—and by myself as the present Principal and Dean.

" As a great pioneer we are proud of what you have done for Veterinary Science, and we wish you continued good health to see still further, for many years to come, the progress in Comparative Medicine—which was initiated by the discovery you made of the parasites in the blood when investigating (whilst a Veterinary Officer in the British Army) the disease known as 'Surra' in horses and camels.

" The frame which surrounds the scroll is made specially for you from a piece of the wood of your old College."

The Presentation Scroll, which was framed in a piece of the wood of the old College, read as follows :

TRIBUTE OF THE ROYAL VETERINARY COLLEGE
TO
DR. GRIFFITH EVANS,
D.Sc. Wales, M.D., C.M., M.R.C.V.S.,
qualified 1855

In recognition of the valuable research services to Veterinary and Human Medicine by Dr. Griffith Evans, rendered with a high courage over a phenomenally lengthy period, this illuminated scroll, from his *Alma Mater*, is presented by the President, H.R.H. the Duke of Gloucester, K.G., and Sir Frederick Hobday, C.M.G., F.R.C.V.S., F.R.S.E. (Honorary Veterinary Surgeon to His Majesty The King), Principal and Dean of the Royal Veterinary College.

Further, it is proposed to set up in the Common Room of the College a carved plaque to commemorate the consent of Dr. Griffith Evans—the Father of the Veterinary Profession—to lead the Veterinarians of the Empire in support of the Royal Veterinary College Hospital Giant Nose-Bag 250,000,000 Farthing Endowment Fund, and in Felicitation of his Hundredth Birthday—August 7th, 1935.

Signatures : HENRY, *President.*
FREDERICK T. G. HOBDAY, *Principal and Dean.*

Dr. Griffith Evans, in reply, said :

" Sir Frederick Hobday,

" I am overwhelmed at the special message from my old College where I began my professional career.

" I feel this has come to me too soon. I cannot find words to express what I wish and what I ought to say. I trust to your kindness if your goodness will consider what I ought to say, and take it as spoken.

" Well, now I'll pass away from the formal and come to a little more ' free and easy.' As all this represents my *Alma Mater*, I should like to say a few words from what I recollect of the lectures, and how they have influenced me throughout my life. I recollect well my old Professors: Spooner, Simonds, and Morton. I think I will commence with Morton.

" Professor Morton was Professor of Chemistry and Materia Medica. He was naturally a poet and sometimes gave a poetical turn to his lectures.

One of his lectures, which has been mostly in my mind throughout my life, was about the action of alkalis and acids on each other in the formation of salts. He pointed to an old diagram which had lines indicating the agent which is attracted and repulsed during the change of elements into the formation of new combinations. He told us of the line commonly called ' of attraction ' on the one side, and ' of repulsion ' on the other. He said ' it resembles love.' You may say that one element loves another one better than the one to which it is at present united.

" Some of you will be able to see why I call this the Chemistry of the Divorce Court. The lower animal has a sort of ' chemical love,' and you may move step by step up to that of mankind ; but there there is a higher element, that of ' friendship,' and I have noticed that in mankind the love which is worth having is that developed on friendship, and that of the Divorce Court is an animal-bred love. I started thinking of this at the College, and this is why I am telling you.

" Now I pass from Morton to Professor Simonds, who lectured on the Diseases of Ruminants. In those days we did not dissect ruminants, we dissected donkeys, but Professor Simonds gave us a lecture, preparatory to his lectures on diseases, on the anatomy of the digestive processes of ruminants. I had seen cattle and sheep ruminating, but I did not understand why until he explained it, and in the course of his lectures there ran through my mind the old saying ' read, mark and inwardly digest.' This impressed upon my mind ' rumination '—mental as well as physical, and I have been ruminating ever since.

" In one of Simonds' lectures he showed us drawings of a condition of the body which we could only find with a microscope. There was no microscope at College then—at any rate for the students—at least, I certainly never saw one; but in ruminating over that lecture, I thought I must have a microscope before I could understand. I asked Professor Simonds how I could get one, and he kindly told me that Baker's in High Holborn was the best place to get a good second-hand microscope. I asked at Baker's, and was informed that there was a very good second-hand one available for £5. I did not know how to use it, but I bought a book to help me, and I was told to be very careful of the lenses, and to clean these I was told not to put ' spittle ' on them, as many had been spoiled in this way. I was told to use clean water.

" At any rate, I started with common things. There were no microtomes then to cut them into thin slices. I began to observe the blood after studying the actual secretions, and I noticed that there were many differences between those of the various species of animals and in my own.

" I was told at College that before I could understand diseases, I must understand healthy animals, so that I went on observing the conditions of the blood in health. I observed also the difference in the appearance of the

blood of animals fasting in the early morning before they got any food, and myself likewise. The blood seemed to differ after food and during the course of the day. I learnt by practice and close observations that there *was* a difference in appearance, especially in that which concerned the white blood corpuscles. I was told many things at College, where I went like a baby to my *Alma Mater* for food. They gave me very little food, although I owe it to them that they put me on my way to finding it; but I found that when I got the food I must cook it myself. Now you will understand how I came to find the cause of this group of blood diseases. I was the youngest student at College, and I was a ruminating animal. That was the reason.

"Now I come to Professor Spooner, the Principal of the College, and Lecturer on the Diseases of Horses. What impressed me chiefly about Professor Spooner was his very frequent confession in his lectures that 'he didn't know.' He wasn't ashamed to say that he didn't know. He was a very remarkable man in this way, and he set us an example that it was our duty to try to find out. I think I may say that his lecture on influenza was the one which of the whole of my life affected me most.

"He always had his snuff-box which he tapped, and out of which he took a pinch of snuff before he began his lecture. He then said: 'Our subject to-day is influenza. A serious disease amongst horses. Gentlemen, what is influenza? The name indicates something "influencing"—influence of one animal upon another. What is influence?—and then he took some more snuff—'Gentlemen, I ask you again, what is influence? God knows. I don't.' Then he went on to say: 'Gentlemen, we all influence each other. In fact we all suffer from influenza.' He then spoke of the way in which influenza was infectious and how 'infection' differs from 'contagion'; illustrating how it affected other animals without their actually touching one another. I ruminated over that lecture on influenza, and since then it has been very helpful to me, and quite lately I found in the Oxford Dictionary the definition of 'influenza.' This all commenced with Professor Spooner's lectures. Then he went on to treatment of influenza. He said that he did not know any medicine which was of any good—confessing his ignorance. I was told that as influenza influenced other animals to become sick, the sick animal must be segregated; and this also applied to all infectious diseases. If impossible to segregate absolutely, then do it as far as possible, and allow plenty of fresh air and keep them free from draughts. In respect to feeding—the animal itself knows best about that. Don't force it to feed, but always allow a plentiful supply of water. In course of time nature will come in. Professor Spooner impressed me with the natural power of recovery, and said that we should help that as much as possible."

During the whole of the time of the delivery of this dissertation, which was given in almost stentorian tones and apparently quite without effort, the audience was in rapt silence and amazement at the accuracy of the phraseology and the power

of recollection expressed throughout; and one could, literally, have "heard a pin drop" when it came to completion.

It had just been finished when the telegram from Their Gracious Majesties the King and Queen was brought up specially from the post office by the Acting Head Postmaster of Bangor, Mr. R. T. Evans. This read as follows:

"The King and Queen are much interested to hear to-day you are celebrating your hundredth birthday, and desire me to convey to you their hearty congratulations. Their Majesties are aware of your distinguished services to veterinary science, and send you their best wishes on this great anniversary."

A telegram was also received from H.R.H. The Prince of Wales:

"With sincere congratulations on your hundredth birthday."

The telegram from the Council of the Royal College of Veterinary Surgeons read as follows:

"The President and Council of the Royal College of Veterinary Surgeons send you hearty congratulations on your hundredth birthday, and sincerely wish you a continuance of good health."

(Sgd) BULLOCK, *Registrar.*

Mr. Lloyd George sent the following message:

"As an old friend, I send you my heartiest congratulations on the celebration of your hundredth anniversary. The Principality feels great pride in one of her sons whose remarkable researches have brought so much relief of human suffering, and whose discoveries in veterinary surgery have had such far-reaching results in the preventing of disease among our dumb friends."

Amongst the numerous other telegrams received were those from: The Liverpool School of Tropical Medicine; National Veterinary Medical Association; Manager, National Provincial Bank, Bangor (he is the oldest depositor); Matthew Dugdill, M.R.C.V.S., Patrington, Hull; Mrs. Evan Jones—once organist—birthday dates coincide; Mr. and Mrs. Humphrey Davies; The Provost and President of the National Welsh School of Medicine.

At this stage an Address from the Council of the City of Bangor was brought personally by His Worship the Mayor (Alderman Richard Thomas, J.P.), and the Town Clerk (Mr. J. Penter Williams). It read:

August 7th, 1935.

"Dear Dr. Griffith Evans,

"We are to-day highly honoured by being allowed to wait upon you, as one of our respected Freemen, to convey to you the heartiest congratulations of the Alderman and Councillors of this Borough on your attainment of your

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Photo by Davies, Bangor

Sir Frederick Hobday presenting the Scroll to Dr. Griffith Evans.

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100th anniversary. Our pleasure is all the more because these good feelings and congratulations are shared by the Citizens of Bangor generally. We all join in wishing you, during the remainder of your days, peace and happiness, and above all, that you be spared the suffering of any pain.

On behalf of Bangor,

Yours sincerely,

(*Signed*) RICHARD THOMAS, *Mayor.*

In reply to this, Dr. Griffith Evans said :

" Your Worship the Mayor,

" I do not know what to say, but in a few words you will understand.

" I have just been receiving, through Sir Frederick Hobday, the congratulations of my old *Alma Mater*, the Royal Veterinary College, and now there has just arrived a telegram from their Majesties the King and Queen.

" Their Majesties, I am sure, will understand that in all experiences of this kind, no congratulations could be more thankfully received than of the people amongst whom I have lived, and that any exultation I have felt at the communications, that of gratitude to my home people must come first. I I appreciate very highly that this is the second time you have come.

" I wish my dear wife were here to see this, as whatever good I have done is due to her help, and I would she were here to share it."

A Family Reunion.

There were numerous personal callers during the day, and the world-wide nature of the greetings afforded ample proof of the outstanding achievements in medicine and veterinary surgery of Dr. Evans. In the afternoon there was a large family reunion at Brynkynallt, including his grand-children at Bangor, the sons and daughters of Mr. and Mrs. E. H. Jones, whom he greeted with his characteristic alertness and sage advice. In spite of a trying day, Dr. Evans bore up with a vigour which would have put many very much younger to shame. We join in the town's greeting and felicitations to a worthy and illustrious Freeman of the Borough.

A Manuscript Letter.

The Duke of Gloucester, as President, and Sir Frederick Hobday, as Principal, of the Royal Veterinary College, are making a special effort to raise funds—a farthing is the unit—to endow the College, and the services of War horses and one War dog are being enlisted. Many millions of farthings have already been given, and a remarkable album has been produced in connection with the movement. To it contributions have been made by Royalty, the leaders of the church, sport, etc., and last June Dr. Evans personally wrote a message for the album.

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The actual message—the calligraphy is really wonderful for a writer on the eve of attaining his one hundredth birthday—is in the album, and is as follows :—

Manuscript letter of Dr. Griffith Evans, the Empire's centenarian veterinarian.

Brynkynallt,
Bangor, North Wales,
June 1st, 1935.

To the Officer Commanding Veterinary War Horses, Royal Veterinary College.

"Dear Sir,

"In reply to your T.V.D.C. of the 29th May, I gladly accept the honour that Sir Frederick Hobday kindly offers me as "The Father of the Veterinary Profession," which reminds me of the long-ago pleasure I had as the youngest student at the R.V.C. with Professors Spooner, Simonds, Varnel and Morton, all so kind and all so personally different in character and manners. I never missed a lecture and dissected all that Varnel advised me. When I went there I knew nothing of the veterinary profession, ancient nor modern. Early in December my father wrote to Professor Spooner telling him I wished to become a V.S. and asking whether I had better go to college before or after I had practical experience. He replied decidedly—"Go to college first," and added that if I registered at college before the end of the Christmas vacation I would be allowed to be finally examined in May of the year after next. I went and passed the examination accordingly. The professors congratulated me. I noticed the students who had experienced most practice neglected college work. The fathers of some of them were members of the college.

"I have been confined to bed a number of years with both of my hip-joints fractured, and so deaf that I cannot hear any human voice. My sight continued good until last year. I have difficulty in reading the printing of newspapers, and I write slowly, but I have not ceased to be a student. It is really wonderfully interesting to be on the onward flow of social and intellectual progress.

"With retrospect of over ninety-five years, I recollect events happening on my fourth birthday clearly. I am glad to observe that progress has been on the whole for betterment. With the many present unemployed, I recollect the experiences of the 'hungry forties.'

"I am recovering from a recent bronchial attack owing probably to the late, long-continued East wind, which has affected me in my old age, not primarily. We have come to a period of learning, much of the atmosphere of which until lately was regarded as lawless, cosmic rays and wireless transit of voices, speeches, etc."

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General Articles

ARCTIC NERVOUS DISEASES.*

By J. BAASHUUS-JESSEN,

Veterinarian, State Studbook Registrar, Oslo, Norway.

Preface

In leisure hours the author has been making extracts from the literature on nervous diseases, especially in the Arctic; first and foremost from the accounts of Polar expeditions, next from works on veterinary and human medicine, physiology and zoology, about 400 works in all. The object aimed at was to throw some light on the problems connected with arctic hysteria, the term "arctic" being adopted solely for the reason that the ailments dealt with are of especially common occurrence in hyperborean regions. But the identical ailments no doubt appear blunted or occur latent in districts a long way south of the Polar regions. On the whole, the polar tracts again and again have proved to be a fortunate hunting-ground because the scientific problems there are forthcoming in clearer detail than in the foggier atmosphere of the civilised continents where the threads of life are too closely entangled and complicated. Therefore, the solution of special tasks in these tracts has often led to elucidation of pure facts of general application.

Although not in the position to present original studies of his own from the polar tracts, the author thinks that a thorough compilation and systematisation of the facts hitherto known will prove to be of great value to those engaged in future field work and laboratory researches. Also the author's comments may, perhaps, be of interest.

Mrs. M. A. Czaplicka, in her book "Aboriginal Siberia" (1914), has given a detailed compilation and discussion of the facts of the nervous ailments pertaining to mankind. The present author has in a general way proceeded along the same line, but he has also included animals, and, furthermore, extended the references to investigations made in Greenland, Arctic America, and on nearly all arctic and antarctic expeditions. And in his comments he discusses the facts from a veterinarian's point of view. W. L. Lindsay, an English alienist, in his dealing with nerve troubles in Arctic districts, gives his opinion as follows: "The ætiology of insanity in arctic or extreme northern countries is in various respects peculiar and exceptional. In countries such as Greenland, Iceland and Lapland there are certain causes directly productive of, or indirectly conducive to, mental

* Reprinted from "Särtryck ur Skandinavisk Veterinärtidskrift för Bakteriologi, Patologi Samt Kött- och Mjölkhygien," 1935.

Reviewers and other students of the problems of false rabies, canine hysteria, "piblokto" and nervous symptoms in connection with scurvy, are requested kindly to send a copy of their publications to the author, under address: Nils Juels gt. 35, Oslo, Norway.

diseases that either do not exist in more southern latitudes; or, if they are operative at all, operate on a much smaller scale or under very different circumstances of detail. The great peculiarity of the ætiology of insanity in high northern latitudes is the dominance of natural or external—in other words, non-preventable—circumstances or conditions necessarily or essentially connected with or depending on latitude and climate. These natural influences are productive of a mental habitude that belongs not only to individuals, but whole peoples; a constitution variously characterised by travellers as melancholia, apathy, indifference, and one that is in itself a predisposition or stage in its production." Contrary to Lindsay, I venture the opinion that the factors are not so much darkness, superstition, etc., as especially malnutrition and loss of body heat first and foremost. Among the different causes enumerated by Lindsay are hunger and thirst, too much of putrid, sour and improper food, especially including salt and fat ones. As to fat food, however, experience from man and animals points in the direction that Lindsay's view is an erroneous one (see the following articles).

It is the intention to have the whole compilation of extracts from the above-mentioned 400 works printed later. But in order to give the readers some idea of the usefulness of the compilation, the author gives below a short outline of six articles which he has recently published in Norwegian, and in the preparation of which the above-mentioned compilation was first employed.

Besides these six articles there will, in conclusion, be presented a chapter (7) containing comments not hitherto published, mainly on the differential diagnosis and treatment of the Eskimo dog disease. Letters in brackets refer to this chapter. Full literature references are presented in the six Norwegian articles.

(1) "Wild Animals Under Culture." From the Norwegian newspaper *Aftenposten*, for January 31st, 1931.

In order to obtain the best hygienic conditions, and to influence favourably the fertility in mink and marten for fur farm purposes, I have recommended feeding at intervals with living mice, *see* page 340.

(2) "Is the Mute Type of Rabies and the Arctic Disease "Piblokto" Deficiency Diseases of a nature related to Scurvy? Whale meat and deadliness among Silver Foxes." *Aftenposten*, March 27th, 1931.

When, in 1915–16, the Norwegian State District Veterinarian, B. Hjelde, had published his authoritative article on the connection between scarcity in sunlight and occurrence of rickets in swine, I began to inquire into the Polar explorers' accounts on sanitary conditions among their dogs and horses.* On a later occasion I will account more fully for my findings, and discuss the problems more in detail from the material concerned; which has not in this respect, as far as I know,

* About this time Professor Simon Paulli, Copenhagen, at my request, informed me that the skeletons of dogs killed under an alleged outbreak of rabies in Greenland, *see* Hjortlund later, did not show any traces of rickets. It was, however, the Norwegian physician Bendix Ebbel, who in a Norwegian publication (1908) first called attention to the interrelation between light and rickets. (Author's note, 1935).

been systematically treated. It may well be possible that other writers have previously been touching several of the facts which I am calling attention to in the present article, and that all of my statements cannot be presented as original findings; but it seems, on the other hand, as if they have not received due attention. On account of the many mysterious deaths lately occurring among silver foxes after preceding paralysis and convulsions, I now have thought it advisable to publish the present short preliminary communication.

From many of the Polar accounts it is evident that a disease *much resembling* rabies often occurs among the Eskimo dogs. In the limited space of a newspaper I find it unnecessary to give a full account of the symptoms and course of the disease, of which E. Astrup, I. I. Hayes, E. Kane and G. S. Nares have given good descriptions.* This disease differs distinctly from dog distemper, which, being of infectious nature, has at times badly devastated the western Greenland colonies. About 1906, the Danish veterinarian S. R. Hjortlund, was sent over there, and he arrived at the conclusion that in the cases examined by him the diagnosis "rabies" was evident. I never have been convinced, however, of the correctness of his conclusions, based as they are upon a few inoculations on rabbits. His article, "De smitsomme hundesygdomme i Gronland,† was published in the *Danish Monthly Magazine for Veterinarians* in 1908.‡ In my opinion, the general tendency during the "great Arctic Night" towards nervous excitement, and a not satisfiable, perverted and depraved appetite, in man as well as in beast, indicates symptoms of a deficiency disease rather than signs of an infectious disease, as the true rabies is. Further, I have arrived at the conclusion that several nervous symptoms are a mild form, or prodromic symptoms, of a disease resembling rabies; or a tendency to tetanic cramps, as E. Kane, with great truth, characterises the phenomenon commonly occurring in Polar tracts.

Highly interesting is the absence of desire to take care of the new-born offspring so often observed among sluts on Polar expeditions, or the more frequent cases of a directly hostile attitude, namely, the so-called "cannibalism." Otto Sverdrup mentions a slut, "Silla," which, in July, 1900, evidently thought the rearing of her own puppies did not keep her busy enough, as she stole and nursed the puppies of another bitch. The same "Silla" later accompanied Roald Amundsen on his expedition through the North-West Passage. During the bad nutritional conditions of autumn 1903, to which I refer later, she not only permitted other dogs to eat her new-born puppies, but, indeed, herself devoured the last of them. This is apparently Mother Nature's own form for insurance during miserable nutritional conditions. Next autumn when, according to Roald Amundsen, the

* The clinical symptoms of "mad" dogs have been described so often that I do not consider it necessary to do so again. It is to be hoped that the symptoms of the disease of mad dogs and of the human disease "piblokto" can both be synchronised for educational purposes either by the Canadian Royal Mounted Police or by Polar travellers in North Greenland. Slow-motion pictures will, no doubt, prove to be of much use and highly interesting.

† "The Contagious Dog Diseases in Greenland."

‡ "Maanedskrift for Dyrlæger."

reindeer were as fat as pigs, she again gave birth to a litter of pups and kept them. Amundsen says that she would have gone through fire in order to reach her puppies after weaning. After receiving food rich in fat the voracity of the dogs and their tendency to gnaw on everything diminishes.

When next I became aware of the fact that a nervous excitement and a strange tendency to gnaw were found also among the Manchurian ponies* Shackleton made use of during his South Polar expedition, and of the further fact that the symptoms of scurvy among Polar travellers and the arctic disease " piblokto " among Eskimos had strikingly many points in common with the disease which S. R. Hjortlund alleged to be the mute form of rabies (A), I came to the conclusion that the latter disease, at any rate in the Polar tracts, is merely a deficiency disease. In the main, the symptoms in both cases are identical. When I say "in the main," it is because the syndromes for the latter diseases have a greater range of variation than the symptoms in infectious diseases. S. R. Hjortlund expressively calls attention to the fact that the sketch of the symptoms in the dogs attacked by the Greenland " rabies " varies greatly, so that under such circumstance descriptions cannot be quite like one another. The conditions osteomalacia and rachitis are indeed widely different. A little child cannot have osteomalacia, since its skeleton consists of cartilage, and a grown-up person cannot display rickets owing to the fact that the skeleton has become ossified. The said pathological conceptions are, with regard to causality, none the less identical, both often being accompanied by various nervous symptoms—cramps *inter alia*. This variation in symptoms of the deficiency diseases and the avitaminosis is, no doubt, due to varying circumstances, such as whether pregnant or not, differences of sex and age, different feeding, etc.

The correctness of the conception that it is not true rabies which occurs among the Greenland dogs is indicated by the following. The disease is not incurable (*see* further, chapter 7.) After having been known for more than fifty years among Polar explorers and in Greenland, the disease has not, according to R. E. Peary, as late as 1910, been transmitted by bite to man or beasts. The believers in the rabies theory have maintained that the cause of this non-transmission is to be sought in the fact that the Eskimos are clad in hide or fur, which cleanses the teeth of the dog from virus before penetrating the skin. They further claim that the tendency to profuse bleedings so common among the Greenlanders causes the virus to be washed out from the bitten wound. It appears to me that both assertions are not well founded, because in sledging it frequently occurs that the dogs' harness and traces become so entangled that, according to all Polar travellers, they can only be unravelled by the dog driver after he has taken his mittens off. The chance of being bitten is then close at hand. R. E. Peary and E. Astrup were repeatedly bitten without impunity by dogs of two teams in which the alleged rabies had broken out upon a severe snow-storm during a sledge journey in 1892. It is of worthy note, further, that the worst combatants among the dogs often seem

* According to my view these obtained too much maize in their food.

not to contract the disease, the cause for this hardly being, as S. R. Hjortlund states, that " mad " dogs in their fits still retain their respect for the former, but rather that the " boss " dog of the team manages to get the lion's share of the food supply, whereby the stronger dog obtains more food, and consequently more resisting power against this deficiency disease.* In Greenland the disease occurs most commonly during the worst of the dark period or shortly afterwards, and at times of specially severe cold, as in February (B).

Roald Amundsen's dogs first sickened from the disease in the Atlantic upon unbalanced feeding with dog biscuits and stock fish, *i.e.*, dried, lean cod.† Of his dogs, these came from Norway direct, where no cases of rabies during that year (1903), nor before or afterwards, is known to have occurred. On receiving a further supply of dogs from Godhavn in Greenland, his stock, however, was again attacked when somewhere north of America. It is well worth noticing that Roald Amundsen had to throw overboard more than three tons of dog pemmican at the time his vessel " Gjoa " grounded on a reef, and that the dogs, prior to the second outbreak, for a long time had been fed on especially lean reindeer meat. Dr. I. I. Hayes' dogs also contracted the sickness upon feeding with lean reindeer meat. He was not, however, aware of the cause, but in any event he kept aloof from believing rabies to be the true cause. M'Clintoch's dogs sickened from feeding on tainted stock-fish. The latter and L. Mylius Erichsen and Harald Moltke observed symptoms resembling those in the alleged rabid dogs upon feeding with fresh shark meat, which is known to be especially " lean " in the ordinary meaning of this word. In November, 1908, Robert E. Peary had lost 53 dogs out of 246. He states that the whale meat on which they had been fed was seemingly lacking in nourishment.‡ On the whole, it seems as if formerly the epidemic type of the disease was more pronounced, and that the disease was more common in the southern parts, Upernivik, Tassiusak and Umanak, where the dogs are fed more on fish, than in the northern district, Cape York, where more blubber is usually given.

Among the foxes in Greenland the identical disease is well known, and has been described by Astrup, Hjortlund and Peary. Trapping of live white and blue foxes, which are in Greenland often living in the same district, is a matter of

* In cases of general hunger only this assumption holds good. Many weaker dogs are then bereft of their food on occasions when scarcity of animal food is prevalent. When devitalised products are fed to dogs, the boss may also contract the disease. (Author's note, 1935.)

† Stock fish contain a surplus of phosphorus in relation to the calcium content, and, further, is practically devoid of fat (Author's note, 1935).

‡ According to feeding trials conducted by R. O. Rochmann in 1931–32 with whale meat exclusively, in order to determine whether such a feeding would produce convulsions in foxes, it was proved with positive results to be so in the case of young foxes only, and that addition of ground fresh bones containing some fat counteracted the occurrence of cramps. I should think that old foxes likewise would have sickened if the said experiments had been conducted with frozen, decayed whale meat, and if simultaneously a severe cold had set in. Peary's experience above-mentioned was gained under such circumstances, a fact corroborated by Harry Whitney (Author's note, 1935).

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daily routine in winter time, but even so, no instance of transmission from bites has been reported. This in spite of the fact that the Greenland blue fox, according to Army Veterinary Captain A. Moholdt's paper, read before the Norwegian Veterinary Association's course on fur farming in January, 1931, particularly bites at the face and hands.

Dogs and foxes leading, even during the cold arctic winter, an out-door life day and night, require, of course, comparatively more fat than man, who lives, partly at least, in heated rooms either in a vessel or in a snow or stone hut. Another circumstance to be taken into consideration is that the dogs, when living in company with man, during periods of scarcity affecting both, will easily come into second rank as regards division of the food which, as far as the blubber is concerned, must also serve as fuel.

According to my view, it is evident that these cases of paralysis, convulsions and other nervous disturbances, as abnormal piercing howling, tendency to biting, wheeling or circling around, and other abnormal and peculiar movements, and probably hallucinations both in man and beast, are due to deficiency of fat. As far as I can judge from existing literature, Roald Amundsen, among the Polar explorers, is the first one to mention the said deficiency as the cause of the disease. In particular, I believe that when all fat dispensable has been consumed, a drain of the glycerine-phosphoric acid in the lecithine combinations of the central nervous system takes place with ensuing nervous disorders, but it is also possible that the loss of fat involves disturbances in the calcium metabolism. On those foxes autopsied by the State Veterinary Institute no pathological changes in the central nervous system were ascertained. Hayes, mentioned above, who was a physician, came to the following conclusion: "Dissection revealed nothing There was no apparent inflammation, either of the brain, the nerve centres, the spinal cord or the nerves themselves, and I was wholly at a loss to understand the strange phenomenon."

All sorts of fat are hardly alike as curative or preventive remedies. Thus Peary had bad results from feeding his dogs on pork, whereas he attained good results from feeding on walrus meat. In Greenland, the latter is given the dogs in slices, with hide, blubber and meat in one piece. Possibly the pork Peary used contained too much salt, which acts as a poison on Eskimo dogs. As curative remedies, I should suppose that the application of calcium compounds combined with sedatives ought to be tried; and prophylactically, or, when the foxes are again able to ingest food, cod-liver oil, with or without phosphorus added, and fresh lard.

According to my notion, the Cape York disease "piblokto" (an Eskimo term, also "poblakto" or "pivdliuvok," that is to say, furious, mad or running amok) holds out a rich field for the study of comparative pathology, and it is possible that such researches may lead to important conclusions further in the understanding of a series of nervous ailments in man. For the raising of dogs and also for fur-farming a continued research of this disease is of the greatest importance. Accord-

ing to my view there are several indications that the disease is identical with the mystic ailment which in English veterinary periodicals is termed "canine hysteria," or fright disease.

In March, 1931, at a meeting of the Geographical Society, I heard H. Ingstad read a paper on his stay among the Canadian Indians north-west of the Hudson Bay. From this account it was quite obvious that these Indians as a rule starved, and on the whole neglected, their sledge dogs. In Constantinople and in Canada, *inter alia*, the so-called mute type of rabies occurs, and it seems to me there are many indications that this disease, as well as "piblokto" and canine hysteria, is one and the same disease, all of them caused by fat and vitamin hunger. It is a question whether everything that goes under the designation "rabies" is in reality this disease.

As is well known, whale, walrus and seal have an enormous layer of blubber beneath the epidermis, while, on the other hand, accumulations of fat in the musculature and abdomen of those known in land animals are practically non-existent. According to Mylius-Erichsen and Moltke, and other Polar travellers, the hide of the narwhale, together with the underlying layer of blubber, is, no doubt, one of the best antiscorbutics known in Greenland. There are no two opinions about the fact that as a vitamin reserve the fat from subcutis is a factor of great importance, though Eskimo dogs, like carnivorous animals in general, when able to chose from an animal killed, seem to value most the vitaminous parts, *viz.*, the blood and the entrails. Whale meat given as food for farm foxes is, of course, not poisonous in itself, but during a typical, long and severe cold period, such as we have had this year (1931), it is highly probable that feeding foxes on it can prove to be a malnutrition, since the fat reservoir of the whale, occurring in the blubber layer, has been removed to serve other purposes.

On the above-mentioned expedition, Otto Sverdrup always gave his dogs extra rations of blubber during the coldest season. From his book "New Land," it would appear that he was in possession of an uncommonly practical insight into and understanding of the feeding and methods of taking care of sledge dogs. This opinion is well substantiated by the fact that his dogs were quite free from the "inevitable" Arctic dog disease (syn. Eskimo dog disease) during his whole expedition in the vessel "Fram" (1898–1902), while practically all other Polar expeditions with a large number of dogs have had their population of dogs seriously decimated.*

(3) "Raw Animal Nutrition. Scurvy and Vitamin C. Tuberculosis and Cancer." From the *Norwegian Veterinary Magazine*, October, 1932.

The Danish clergyman, C. Bastholm, in 1803, with great truth stated: "In the cultivated countries we learn only what man can be, in the uncultivated countries what man is." Through the literature mentioned in my preface (*see* page 310) I have also come in close contact with the literature on scurvy. In

* A translation of this article is to be found in *Munchener Tierärztliche Wochenschrift*, 1933, No. 36, page 425.

this article several of Ottar Rygh's statements on scurvy, especially the vegetable line of reserach *versus* the raw animal nutrition line, are discussed and contested. The latter line, tried by the pioneer Polar explorers, mostly with the very best results, has been totally overlooked by Rygh in his account (1931) of the alleged discovery of the chemical composition of the synthetic C vitamin. Scurvy, no doubt, is not conditioned by absence of a single factor, vitamin C, but by several collateral causes, first and foremost of which is loss of body heat, either as consequence of lack in sunshine and fat, or as a consequence of living in damp and cold rooms, *cp.* further page 337. This must be emphasised. The said causes combined in a high degree also promote the development of another deficiency disease—rickets. Heating of the floor by means of electricity, as adopted experimentally of late, has kept the stock of swine houses free from rickets, which was formerly badly ravaging the occupants.

The correctness of the assertion that scurvy in man and in guinea-pigs are identical ailments is, in my opinion, open to doubt. The pathologic-anatomic symptoms of the " experimental " scurvy in guineapigs may just as well be the result of some other deficiency disease as of manifest scurvy. The experimental scurvy may very well be a mixed symptom complex in which also rickets and osteomalacia are represented. Various types of nervous symptoms often accompanying scurvy in Polar travellers are not mentioned at all in Holst and Frolich's classical investigations, nor by O. Rygh. Microscopic and dissection material from the former cases are not mentioned at all. A series of Polar travellers has shown that meat from animals laid down in the Polar regions acts as curative antiscorbutic. During periods of severe cold about one-third of the food may consist of fat. Several Eskimo races either do not eat products from the vegetable kingdom, or have consumed their supply of these products when the severe winter time sets in in earnest. The hyperborean races use practically everything on an animal as food, except bone tissue, sinews and horny substances. Most noteworthy is the rapid change for the better in scurvy after ingestion of fresh blood, even in cases of deranged mentality.

Among Greenlanders tuberculosis seems to gain hold at a pace approximately proportional to the abolition of their old sources of animal food, especially seal meat. Danish physicians have pointed out how rare on the whole cancer *was* at at the beginning of this century in the Danish colonies. In the fight against tuberculosis certified milk is nowadays supplied to town children. I should think that in high mountain sanatoriums this disease will in future be combated by administering blood from reindeer and other animals leading an open-air life, and therefore being in a thorough mineral and vitamin balance. Also against several other ailments such blood will no doubt be resorted to as a tonic. As to the latent types mentioned in my preface (*see page* 310), pathological phenomena as apoplexia, certain types of arthritis, rheumatism and asthma, and in horses, crib-biting and the tendency to run away, ought to be looked upon as results of deficiency diseases.

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(4) "C and D Vitamins." From *The Norwegian Veterinary Magazine*, December, 1932.

The fact that seal meat, even if kept in a frozen state for a long time, retains antiscorbutic properties, is shown by Dr. Frederic A. Cook as a result of experience gained on the " Belgica " expedition. This is also corroborated by Roald Amundsen, another member of that expedition. This experience disproves the assertions of the chemical analysts that vitamin C ceases to exist in the animal body after death. It is noteworthy that various Salmonidæ in a fat condition (not immediately previous to spawning), with their rich content of A and D, possess preventive anti-scorbutic effect, although they are supposed to contain no vitamin C. To scurvy is further attributed an accompanying tendency to become liable to fractures, but in the extensive literature I have examined I found but a single case where a fracture is mentioned in connection with the appearance of scurvy. As being far more commonly associated with scurvy, nervous derangements are mentioned. Roald Amundsen, who was not only well practised, but also very well conversant with Polar literature, seems to indicate that scurvy and madness go together, the madness attained being either permanent or passing. I particularly remember a case when a member of a sledge party incurring a long period of famine lost consciousness, but that a rapid and complete change for the better took place after dosings of blood from an ice-bear. General hunger, and, as presumed with scurvy, vitamin deficiency, are often combined.

(5) " Scurvy and Rickets." From *The Norwegian Veterinary Magazine*, April, 1933.

W. H. Neale and Leigh Smith, later F. Nansen and Hj. Johansen, wintered on Franz-Joseph Land on ice-bear meat and blood as a staple diet. They had no lime-juice in their provisions. Some authors have ascertained that the liver is the source of the animal vitamin C. The fact that a series of expeditions from the Barentz to the " Denmark " expedition in 1910 has proved bear's liver to be poisonous must point in the direction that meat, blood and the other internal organs are also in possession of antiscorbutic properties. Nansen and Johansen highly appreciated toasted brain.

Apart from the nerve system, antiscorbutic properties as well as lecithine are to be found in tissues exhibiting, or being in a state just undergoing, an intensive cell division, *viz.*, red marrow, red blood corpuscles, and the organ most of all rich in blood, *i.e.*, the liver. To lecithine is attributed a driving and regenerative influence on the growth. Reserve layers of this phosphoric combination are also to be found in the fat tissue on various places of the body. The hide of white whale and narwhale, which is known in Greenland, under the designation "matak," as an excellent remedy against scurvy, is to be regarded as an enormous layer of *Rete malpighi*, its thickness indicating that an intense cell-division take place.

Earlier writers have entertained the opinion that the phosphatides are antidotes of several deficiency diseases, but the proof is difficult to give, because the

phosphatides are regarded as contaminated with vitamins.* In ascertaining whether scurvy in guinea-pigs is partly rachitic in origin, not only compounds of lecithine, but also of calcium-natriumlactate, phosphorus dissolved in cod-liver oil and compounds of ergosterine ought to be tried. In *Terap. Monatschr.* for 1913, van der Welden has maintained that calcium therapeutics is effective against scurvy. J. Qvigstad states that the Laplanders of Northern Norway and Sweden have long since used not only blood of reindeer and seal against scurvy, but also fish liver, which latter, according to our present knowledge, first and foremost should contain the anti-rachitic vitamin. According to another source, Linnæus has stated that he never heard of scurvy among Laplanders.

(6) "On the Importance of Additional Feeding with Calcium and Phosphorus Compounds." From *The Norwegian Veterinary Magazine*, November, 1934.

I recall the fact that experimental deficiency in minerals has been proved to lead to various nervous symptoms, especially hysteria, cramps and paralysis, and I further call attention to a possible connection between the occurrence of deficiency diseases of various types in swine and cattle, on the one hand, and, on the other, to a hyper-nervous condition in man, accompanied by religious and erotic excesses combined with glossolalism, piercing cries and demoniacal possession, as is to be found nowadays in certain districts of south-west Norway, and formerly in Dalkarlia in Sweden. When appearance of nervousness and insanity occurs in connection with the flaring-up of religious sectarianism in a district, we often find a taboo against this or that form of food, particularly blood, fat and meat.

As to the Arctic Dog Disease, I think that it is caused by mineral deficit and fat hunger, with the latter as a contributory cause (*see* further, page 338). According to *Our Dogs* of November 11th, 1932, Professor Sir Frederick Hobday seems to have arrived at the conclusion that canine hysteria is caused by want of fresh animal matters in the food. The renowned Siberian investigator, Wm. Bogoras, maintains that he has known many persons bitten by alleged rabid dogs, but in no case did hydrophobia thereupon afterwards develop. According to other knowledge obtained, I know of no case of such a transmission neither in Alaska nor in Greenland.

I further call attention to the statement by Wm. Bogoras that the most

* According to a press report of April 29th, 1935, two Danish scientists, Hendrik Dam and Fritz Schonheyder, have discovered a new fat soluble vitamin K, necessary for poultry. Whether it is necessary for other animals or for man is not yet ascertained, but this is under investigation. Dr. Dam noticed some years ago, during an investigation on the cholesterine metabolism in chickens, that these animals, when living on an artificial food containing an abundance of the known vitamins and other necessary constituents of food, were afflicted with a peculiar deficiency disease which, when cursorily regarded, had some resemblance to scurvy. It proved, however, that lime juice, very rich in C, could not prevent the new disease. By replacing some of the constituents of the artificial food with other nutrients, it proved possible to prevent the disease, and a further investigation of the curative constituents gave as a result that the effect is attached to the extracted fat whereby the nutrient concerned is to be classified with the known vitamins A, D and E. Success was achieved in demonstrating that the active factor is not identical with the said vitamins. (Author's note, 1935.)

essential point in the perfection of so-called Shamans is abstension from youth from all fat and rich food, and, in general, great moderation in eating. Shamanism, in variants extending over practically all the hyperborean regions, is a form of religion, the chief practitioners (Shamans, in Greenland : Angekoks) of which in their typical representatives are distinctly nervous, irritable, hysterical, half-crazy individuals, and strikingly, often epileptics. It is noteworthy too that the modern medicamental emaciation among women often results in serious nervous derangements, further, that the consumption of much fat in man often seems to soothe an irritable nerve system.

Also Saxl and Disquè, quoted by Oscar Loew, have shown that scurvy can be cured by calcium lactate. In southern Norway the most efficient cure of an untypical osteomalacia in cattle is, according to L. Slagsvold, ashes from foliferous trees, in sour milk, all modern remedies, even phosphoric acid and compounds of vitamin D being taken into consideration. On the whole, a moderate admixture of fat to the food in our latitudes seems to promote the assimilation of lime and phosphoric minerals. During hunger an excretion of lime takes place, and according to Oscar Loew, a diet deficient in lime will result in a loss of body calcium greater than the assimilation of same. In arctic and subarctic regions the loss of calcium due to the said lack of fat, when occurring simultaneously with prevailing extremely cold weather, must, one should think, lead to a breakdown of the nerve system.

In the *Magazine of the Norwegian Medical Association* for 1930, the County Physician, N. Christoffersen, states that true Laplanders are practically free from epilepsy. This observation in connection with the following one may be of considerable interest : In *The Norwegian Magazine for Medical Science* of 1840, the District Physician Walter, states that he has never encountered scurvy among true sea or reindeer Laplanders, whereas Norwegians and Finlanders of the same regions were suffering from it ; *see* also quotation from Linnæus in the preceding article, last sentence. Walter attributes this to the use by the former of a herb, *Rumex acetosa*, but I rather believe that their " immunity " is due to rich animal food in the diet.

The fact, according to medical investigators, that blood from ordinary farm stock animals does not contain vitamins, while, on the other hand, in Polar regions blood has a curative effect on scurvy, and seems to be regarded by natives and foreign trappers as a panacea to be consumed with greediness, also by beasts, indicates that good reasons exist for verifying closer the width of variation as to the content of the constituents of the blood with regard to vitamins and minerals.

Devitalised modern food, often second quality in every respect, in connection with the drinking of much coffee, seems to diminish the power of resistance against tuberculosis, and to further development of caries in the teeth, nervous disorders being often a concomitant. So far, in the physician's opinion. The way out of this, in my opinion, lies in a diminishing of the carbohydrates and correspondingly an augmentation of fat and minerals in the food.

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Since manifest scurvy is often accompanied by severe nervous derangements, I suppose that latent scurvy in subarctic regions may be held responsible for diverse nervous anomalies. The existence in certain parts of Norway of a generally prevailing geologic substratum deficient in lime, and a tendency towards nervous disorders in the same districts, especially during the season of obscuration, may indicate that a possible deficiency in fat, lime and phosphoric constituents exists. In the author's opinion, the typical " temper of a population " of such a district is chiefly due to the nourishment produced in those localities. In districts where deficiency diseases in animals are prevalent, special care ought to be taken to achieve a correct balance by the introduction of products from the sea and through food produced elsewhere. Malnutrition and its correlation with internal secretion probably constitute a wide field for research in the domain of mental hygiene.

(*To be continued*)

"STRIKE" OF SHEEP IN NORTH WALES.

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During the past eleven years in North Wales the writer has availed himself of every opportunity to observe and study sheep losses characterised by sudden death. A survey during the earlier years led to the conclusion that three diseases were mainly concerned. The Welsh name " clwy coch " is usually applied to that disease of sheep in the first year of their life which occurs during the October–February period. On evidence obtained from post-mortem and bacteriological examination of carcases and from trials of *Vibrion septique* toxin-antitoxin mixture and anaculture as preventives, there are good grounds for regarding " clwy coch " as identical with "braxy." The second main disease of this type occurs in young lambs three to eight weeks old, and is commonly known as " tarawiad," or " strike," or ascribed to wool-balls. This disease has been shown [6, 7, 9] to be identical with the pulpy kidney disease of Tasmania and New Zealand —an enterotoxæmia caused by *B. ovitoxicus*. The third disease in this category is that most commonly known as " gwaew " ; in some localities as " strike." It is not contended that all sudden deaths among sheep in North Wales fall readily into one of these categories, but it would certainly appear that the great majority can be attributed to one or other of these conditions. This article describes observations which were designed to determine the nature of " gwaew " or " strike."

" Strike " occurs among mature sheep, particularly those on lowland pastures. Very generally illness is not observed, the sheep having died during the night, or dying during the course of the day, within even an hour of its having been observed grazing normally. Frequently there is no evidence of struggling prior to death, the position of the dead animal suggesting sudden death in a natural lying posture.

Occasionally, there are signs of some struggling, the passage of a small quantity of diarrhœic or slightly blood-stained fæces and the presence of a little froth round the mouth. Only rarely is an affected sheep seen alive. It lies with the head turned towards the flank and rises with great difficulty, only to lie down again. There may be convulsions prior to death or the sheep may show little more than accelerated respiration and die quite suddenly. Although the disease is generally hyperacute, very occasionally cases live in a semi-comatose state for as long as two days.

The disease has a distinct seasonal incidence coinciding closely with the occurrence of conditions conducive to the quick growth of young grass. In certain coastal districts losses may be experienced as early as the middle of February, but more generally the period during which deaths occur lies between the middle of March and the middle of April. Following a hard or moderately hard winter, deaths occur during or following each period of mild spring weather.

The mortality rate on any farm is very variable. The disease may cause a 7 per cent. loss on a farm where previously it was almost unknown and where subsequently very few deaths occur. There are, however, certain farms which regularly experience some loss—even then the death rate varies much from year to year. It is not uncommon for all the deaths in any season to occur within as short a period as ten days. It is popularly held that the dressing of the pastures with artificial manures, particularly basic slag, bears some relation to the incidence of the disease. On a number of occasions such treatment has been followed by the occurrence of a crop of cases. Furthermore, in several instances there is the history that the particular fields having received little cultural attention during a period of years, the incidence of this disease has been much increased following their improvement by the application of artificial manures, etc.

There is little evidence suggesting an age susceptibility, but information on this point is difficult to obtain, since the disease occurs most commonly among flying flocks kept for the production of early lambs. In these flocks the ewes are purchased from the mountain grazings at about four years old and maintained on lowland pastures through two, occasionally three, lambing seasons. It certainly appears that the incidence of the disease is greater among ewes which are spending their second season on lowland, but this incidence may be more closely correlated with the condition of the sheep than with actual age. Very generally the sheep affected are those which the farmer would describe as his best. They are certainly, with very rare exceptions, in high condition and thriving.

During the period of eleven years some 50 carcases (the records of some of the earlier cases are not complete) of sheep which have died or been killed when moribund from this disease have been examined.

It was early apparent that putrefaction commenced very soon after death and that material of value for pathological and bacteriological investigation could only be obtained from animals just dead or dying. The following are the characteristic lesions seen in the carcase of a recently dead animal. A marked

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congestion of the mesenteric vessels is present; occasionally some slight congestion of the fourth stomach and a distinct, often patchy, congestion of the small intestine. In some cases this congestion of the intestine is very marked and quite extensive, in others it is confined to relatively small areas. The contents of the small bowel are frequently much reduced in quantity, particularly fluid, and almost regularly blood-stained, even markedly so. The large intestine is usually normal, but in some cases there is a very distinct congestion of the cæcum. The mesenteric lymph glands are soft and exude some fluid on section. The liver and kidneys are congested and, if post-mortem examination is delayed even two hours after death, the latter exhibit the pulpiness characteristic of pulpy kidney disease in lambs. While there is some congestion of the lungs, the principal lesions in the thoracic cavity are associated with the heart. A varying excess of pericardial fluid with subepicardial hæmorrhage, particularly along the course of the coronary vessels, is evident. Subendocardial hæmorrhage, which may be extensive and is generally confined to the left ventricle, is characteristic. In no instance has any lesion of the musculature been detected.

Throughout this work it has been extremely difficult to obtain carcases sufficiently soon after death to merit their extensive bacteriological investigation, but four suitable cases were obtained prior to season 1931. One of these was killed for post-mortem examination and the other three examined within 15, 20 and 30 minutes respectively after death. In each case ærobic and anærobic media were inoculated with liver, kidney, pericardial fluid and heart blood. In three cases no organisms grew, and in the remaining case the liver culture yielded a mixed growth.

The Toxicity of Intestinal Contents.

Since 1931 the intestinal contents of each available sheep carcase recently dead of " strike " have been examined for toxicity. The period between death and examination varied somewhat, but is believed not to have exceeded six hours in any case. A sterile filtrate of the contents of the small intestine, mixed with an equal volume of saline, was prepared after the manner used in the local investigations of pulpy kidney disease.[7]

Six of the seven filtrates obtained during the 1931 season proved toxic to laboratory animals (intravenous injection into rabbits and mice). The exceptional case was that of a ewe found ailing in the morning and which remained in a semi-comatose condition until chloroformed at 4 p.m. The post-mortem appearances were those of " strike," but the filtrate (5 c.c. i/v to a rabbit and 0.4 c.c. to mice) was non-toxic.

In the spring of 1932 four filtrates were obtained. Three of these proved toxic. Much difficulty was experienced in filtering the diluted contents of the small intestine of the fourth case, and only a small quantity of filtrate was obtained. It failed to kill mice in a dose of 0.2 c.c.

Each of the four filtrates obtained in 1933 were toxic. In this year, however, the technique was somewhat altered in that the intestine was tied off into a

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duodenal portion (the first three feet), an iliac portion (the last four feet) and a jejunal portion (the remainder); which latter was divided into two equal parts. Separate filtrates were obtained from the contents of each of these parts. In no instance was the duodenal filtrate toxic, but the filtrates from the other sections of the bowel were highly toxic in each case. Although an accurate estimate of the M.L.D. for mice of these sectional filtrates was not made, it appeared that the filtrate from the second part of the jejunum contained the toxin in the greatest concentration in two, and in much the greatest concentration in the remaining two, cases.

Four cases of "strike" were secured in 1934, and from each a toxic filtrate was obtained. In three of these the M.L.D. for mice on intravenous injections was 0.005 c.c. of filtrate (0.0025 c.c. intestinal contents), and in the remaining case 0.008 c.c. of filtrate.

The toxicity for sheep of two of the 1931 and one of the 1932 filtrates was tested by intravenous injection. One of the 1931 filtrates was injected in a dose of 20 c.c. The sheep died seven minutes after the completion of the injection. Each of the filtrates killed sheep within half-an-hour of the injection of 5 c.c., the symptoms and post-mortem appearances, particularly those of the heart and kidneys, being characteristic of "strike."

The Nature of the Toxic Element in Filtrates of Intestinal Contents.

The nature of the toxic element was investigated by observing its neutralisation with various high titre antitoxins obtained, through the courtesy of Mr. T. Dalling, M.R.C.V.S., from the Wellcome Physiological Research Laboratories. The procedure adopted was that of mixing the filtrate with an equal quantity of the antiserum, incubating the mixture for half-an-hour and injecting (intravenously into mice) a volume of that mixture which, had neutralisation not occurred, would contain at least 20 M.L.D. of the toxic element. Antisera prepared against *V. septique*, the lamb dysentery bacillus and *B. œdematiens* were used in 1931, and these antisera, together with *B. welchii* and *B. paludis* antisera, in 1932. In no case did neutralisation take place.

Since other work [5, 7] had shown that lamb dysentery serum was inconsistent in neutralising *B. ovitoxicus* toxin (serum of pre-1929 production protecting against this toxin, whereas samples of more recent production failed), the two types of this antiserum were employed in neutralisation experiments in the 1933 season. In addition, antisera prepared against *B. welchii*, *B. paludis*, *B. welchii* (Wilsdon Type D) and *B. ovitoxicus* were included. Bennetts had been good enough to send a small supply of *B. ovitoxicus* antiserum, and the writer is indebted to the Wellcome Physiological Research Laboratories for an ample supply of the remaining antisera. The only sera which afforded complete protection against the toxic element in each of the 1933 filtrates (whether jejunal or iliac) were; *B. ovitoxicus* antiserum, *B. welchii* (Wilsdon Type D) antiserum and the lamb dysentery serum of pre-1929 production. This result was confirmed in observations with the toxic filtrates obtained in 1934.

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Bacteria of the Welch Group Isolated from Intestinal Contents.

In 1932 an attempt was made to isolate an organism of the *B. welchii* type from the contents of the small intestine of a very recently dead case. In this the writer appeared to be successful, but, since the strain isolated failed to produce a good toxin when incubated for 24 hours, the culture was discarded.

In two of the four cases investigated in 1933 and one of the 1934 cases the cultural technique used in similar work on lamb dysentery and pulpy kidney disease [8, 9] was adopted. An " original " culture was obtained by inoculating a freshly boiled and cooled tube of horse-flesh medium with material taken direct from the contents of the various parts of the intestine or mixed intestinal contents and incubating for 6 to 12 hours. A 250 c.c. bottle of the same medium was seeded from this original culture. The " test " culture so obtained was incubated for three days, at which time it was possible, in each case, to demonstrate the presence of a toxin of the type produced by *B. ovitoxicus*.

The " original " culture was plated on blood agar and incubated anærobically. Ten well isolated hæmolytic colonies of the type produced by organisms of Welch group were picked off into meat broth. These cultures were purified by alternate rapid subcultivating and plating through several generations. In this manner ten pure cultures of an organism, tentatively accepted as of the Welch group on evidence of morphology, hæmolysis on blood agar plates and stormy fermentation of milk, were obtained from each of these three cases. These thirty strains were typed by observing the neutralisation of the toxin they produced after 24 hours, 3 days, 10 days and 15 days incubation. In each case a toxin was produced which was neutralised only by *B. ovitoxicus* and *B. welchii* (Wilsdon Type D) antisera and by the " old " lamb dysentery serum. It could, therefore, be claimed that all these thirty strains were of *B. ovitoxicus* (*B. welchii* Wilsdon Type D).

Discussion.

Bennetts[1] has defined so-called braxy-like disease of sheep in Western Australia as an infectious enterotoxæmia due to rapid multiplication of and toxin production by *B. ovitoxicus* in the contents of the small intestine. He placed this organism in the Welch group of bacteria and differentiated it from other known members of the group by cross neutralisation tests. There is good reason for regarding *B. ovitoxicus* and Wilsdon's *B. welchii* Type D as indentical.[11]

In its occurrence and post-mortem appearances there is a striking similarity between the disease which Bennetts investigated and " strike " in North Wales. The demonstration of the presence of toxin in the intestinal contents of 17 of the 19 cases of " strike " investigated; the determination of the toxin as of the *B. ovitoxicus* type in each of the eight cases examined after antiserum of this type was available, and the isolation of *B. ovitoxicus* (apparently the only type of *B. welchii* present) from the intestinal contents of each of the three cases studied, seems sufficient to define " strike " in North Wales as identical with braxy-like disease in Western Australia.

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Gordon[2] has identified toxin of the *B. ovitoxicus* type in the contents of the small intestine in two outbreaks of disease in adult sheep in Scotland. The circumstances under which these outbreaks occurred were somewhat different from those associated with " strike " in North Wales, but Gordon concluded that a disease at least very similar to that investigated by Bennetts did occur in Scotland.

McEwen and Roberts[4] have shown " struck " of the Romney Marsh to be an acute enteritis, peritonitis and toxæmia due to the multiplication and toxin production of *B. paludis* in the alimentary tract. There are certain notable differences between this disease of the Romney Marsh and " strike " of North Wales, particularly the tendency which the *B. paludis* shows to invasion of the carcase and to the production of post-mortem lesions simulating those of black-quarter in cattle. The writer has not yet encountered a case of " strike " in which these lesions were present, nor has toxin of the paludis type been detected in any intestinal contents filtrate.

McEwen[3] isolated a sporulating anærobe very similar to the type of *B. œdematiens* which causes black disease, Turner[10], from the tissues of two of three sheep from North Wales. In each case death had occurred suddenly. It cannot, of course, be said that this organism was responsible for the death of these sheep but it is of interest to note that it was not encountered in the early part of this investigation when bacteriological examination of very recently dead carcases was undertaken. Furthermore, although fluke infestation is of common occurrence in North Wales, no sudden deaths simulating black disease have come to the writer's notice.

Summary.

(1) " Strike " of adult sheep in North Wales is a disease characterised by sudden death and having a seasonal incidence closely associated with periods of quick growth of grass in spring.

(2) Bacteriological examination of the carcases of very recently dead sheep has given negative results.

(3) A toxin was demonstrated in the contents of the small intestine of 17 of 19 cases of the disease.

(4) Each of the eight filtrates, obtained after antisera prepared against *B. ovitoxicus* and *B. welchii* (Wilsdon, Type D) were available, was shown to contain toxin of the *B. ovitoxicus* type.

(5) B. *ovitoxicus*, *B. welchii* (Wilsdon, Type D) was apparently the only organism of the Welch group present in the intestinal contents of the three cases studied in detail.

(6) It is concluded that " strike " of adult sheep in North Wales is an infectious entero-toxæmia of the same nature as the braxy-like disease investigated by Bennetts in Western Australia.

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DISTRIBUTION AND COMPARATIVE MORBID ANATOMY OF TUBERCULOSIS IN CAPTIVE ANIMALS *

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Zoological Distribution.

All orders of mammals, birds, reptiles, amphibians, and even fish, are liable, when kept in captivity or domestication, to contract an infection with acid-fast bacilli that cause in the tissues granulomatous inflammations or tubercles in which the specific bacilli can be demonstrated by the Ziehl-Neelsen method of staining. There is, however, a great difference in the degree of susceptibility of the various families and genera comprising an order of the animal kingdom. For instance, among Perissodactyla—in which Equidæ and Tapiridæ are included —tuberculosis is comparatively rare in mammals of the genus Equus. The disease is uncommon in the domestic horse. Calmette found only one case in 15,000 cab-horses examined in Paris. It was, and perhaps still is, more frequent in London horses ; but among over 3,500 old decrepit horses slaughtered during the last ten years for feeding to carnivores in the London Zoo, no case of tuberculosis has been detected by veterinary inspection. Donkeys and mules are even more highly resistant, and it is stated that they do not acquire the disease naturally. I have seen no case of tuberculosis in any species of wild horse, ass or zebra, and, though the latter are very common menagerie animals, I can find only one case recorded in the literature.[1] Tuberculosis in horses is usually an abdominal disease, characterised by enlargement of mesenteric or cervical glands and large tuberculoma in liver and spleen. Among the Tapiridæ, however, both the existing species of tapirs are very susceptible to tuberculosis of the pulmonary type, and in captivity they commonly die from this. The

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Australian and American marsupials are relatively resistant; only a very few cases have been recorded in kangaroos and American opossums. In the order Artiodactyla, in which Cervidæ, Bovidæ, Suidæ and Camelidæ are included, the deer, antelope, oxen and pigs are perhaps the most susceptible of all mammals, whereas amongst camels remarkably few cases of tuberculosis have been recorded in India and Egypt, where this common domestic animal must have ample opportunity of acquiring infection. Their American representatives, the llamas, however, are commonly infected.

The only animal of economic importance that is commonly infected with avian tuberculosis is the domestic pig, and in the rare instances in which man has become infected with the avian type it seems more likely that he got it from a pig than from a bird. Young calves are occasionally infected with avian tubercle, and Stanley Griffith has described a case of chronic infection of the udder of a goat with avian tubercle.[2]

In the London Zoo a kangaroo recently died with tuberculosis of the pancreas, from which Stanley Griffith isolated the avian type of bacillus. Reptilian tuberculosis is found in crocodiles, lizards, snakes and frogs. The tubercle bacillus of cold-blooded animals is not infective to mammals, so far as is known at present; and the susceptibility of birds to reptilian or amphibian tuberculosis is as yet unsettled.

Tuberculosis among animals living free in their natural habitat is extremely rare, but any species of wild deer, antelope or swine running free in parks or estates where cattle graze is readily infected from tuberculous domestic animals. Cases of natural infection have been reported, however, but they appear to have occurred only in *Mus musculus*, the common house-mouse, and *Mus decumanus* the rat, species which in towns are almost domesticated creatures, often living in close association with infected humans, cattle or poultry.

The disease appears to be equally rare as a natural infection among wild birds. Perhaps the only genuine case is that recorded by Shattock in a wild lapwing (*Vanellus vanellus*) captured in Scotland, a species rarely kept captive. This specimen is now in the Museum of the College of Surgeons.[3] Hare, late pathologist at the Royal Veterinary College, recently described a case in a wild blackbird (*Turdus merula*) that was killed by a cat in a London garden, and may have escaped from captivity.[4] Another case in a kestrel hawk (*Falco tinnunculus*) recorded by Hammond Smith is open to the same possibility of having become infected whilst in captivity. I myself have examined several tuberculous so-called wild pheasants picked up dead on shooting estates, but in every case it was ascertained that they were hand-reared birds and probably infected from their foster-mothers—domestic hens. Wild partridges are occasionally infected in the same manner. It seems probable, therefore, that there is no tuberculosis under wholly natural conditions of life in which nature demands continuous 100 per cent. efficiency in all wild creatures permitted to enjoy her freedom, and when man was a roving wild animal living in small parties, hunting and gathering his

sustenance in the wilderness, it is unlikely that he was a victim of this chronic debilitating disease.

Among primates the Pongidæ (the great apes), the Catarrhini (Old World monkeys), and the Platyrrhini (New World monkeys) are about equally susceptible to tuberculosis of human or bovine type, except the Lemuridæ (lemurs), which are lower in the scale and less susceptible. Gibbons (hylobatidæ) and the Hapalidæ (marmosets) appear to be highly resistant, though the latter are commonly kept in public menageries and privately as pets, and therefore presumably exposed to infection. I have searched the literature in vain for a record of tuberculosis in gibbons and marmosets, and though I have examined many of these animals during the last seven years, I have not yet found one infected with this disease. It may be noted also that certain manifestations of tuberculous infection, such as tuberculous disease of bones and joints, cutaneous tuberculosis, lupus and lichen scrophulosum, that occur in the human subject, do not appear to have been recorded among subhuman primates, possibly because the disease progresses so rapidly in these animals that they die before lesions can be recognised in the more resistant tissues. Some years ago tuberculosis was very prevalent among primates in the London Zoo and caused heavy losses, but since 1926 the incidence in apes and monkeys has been so reduced by sanitary methods that the disease now occurs only as an importation in newly-arrived animals. It is detected during their period of quarantine and the infected animals are destroyed. Among small wild animals that are often kept as pets in England the common hedgehog may be mentioned as one in which tuberculosis is not infrequent, and is probably acquired from eating tuberculous sputum or being fed on infected cow's milk.

Tuberculosis is widely distributed among all families of captive carnivora except hyænas and the pinnipedia (sea lions, walrus and seals), in which I can find no record of this disease.

The zoological distribution of cases of tuberculosis among mammals in the London Zoo during the last seven years is shown in Table I.

TABLE I.

	Cases.
Pongidæ (gorilla, chimpanzee, and orang utan)	4
Catarrhini (Old World monkeys)	9
Platyrrhini (New World monkeys)	5
Bovidæ (oxen, antelope)	20
Cervidæ (deer)	13
Tapiridæ (tapirs)	3
Suidæ (swine)	1
Viverridæ (civets, mongoose)	3
Canidæ (dogs)	2
Petauristidæ (squirrels)	1
Macropodidæ (kangaroos)	2
Felidæ (tiger)	1
Ursidæ (bears)	5
Pteropodidæ (fruit bat)	1
Cuniculidæ (cavy)	1
Camelidæ (llamas)	2
Erinaceidæ (hedgehogs)	1
Procyonidæ (coatis)	3
Dasypodidæ (armadillo)	1

For types of infecting bacilli in captive wild animals from the London Zoo see: "Isolation of Tubercle Bacilli from Captive Wild Animals." By R. Lovell. *Journal of Comparative Pathology and Therapeutics*, vol. xliii., Part 3, pp. 205-215, September, 1930. "Tuberculosis in Captive Wild Animals." By A. Stanley Griffith. *Journal of Hygiene*, vol. xxviii., No. 2, November 26, 1928.

I know of no bird that is not liable to infection with the avian type of tubercle bacillus when kept in captivity. It is possible, however, that among the 14,000 known species of birds at present in existence some may be immune. In the London Zoo, however, tuberculosis ranges through birds of all sorts and sizes, from ostriches to humming-birds. Gallinaceous birds, pigeons and ducks are most susceptible; flamingoes appear to be the least susceptible, and live for years in a crowded duck-pond in which there are tuberculous ducks. I myself have seen only one tuberculous flamingo, and I have examined many of these birds. With the exception of cockatoos and parrots, birds are resistant to the human and bovine strains of tubercle bacilli, though in America human tubercle bacilli have been reported in gallinaceous birds and one case of bovine tubercle in a duck.[5]

Morbid Anatomy and Histology.

In nearly every case of tuberculosis in captive wild animals the primary lesion occurs in the lung or in the intestine, and is followed by secondary lesions in the lymph channels and lymphatic tissues; and in the most susceptible creatures, such as bovines and gallinaceous birds, general dissemination of the disease may be very rapid, and tuberculous foci may be found in almost every soft tissue of the body. Tuberculosis of bones is rare in captive wild animals, and is most likely to be met with in the spinal vertebræ of bovines. Tuberculous arthritis is not uncommon among gallinaceous birds, but I have not yet seen a tuberculous joint in a wild mammal. There is a general similarity in the gross and microscopic appearance of tuberculous lesions in all classes of animals, but they may vary in distribution and in their destructive effects according to the kind of animal infected. For instance, carnivora show an ulcerative type of the disease, and extensive pulmonary cavitation and gangrene is usual in tuberculosis of felines, but is uncommon in bovines, wherein caseating broncho-pneumonia and pulmonary consolidation with a plentiful distribution in the pleura of the characteristic firm, dense globular tubercles known as pearl nodes and caseous or fibro-calcareous masses of tuberculous lymph glands are the usual manifestations of pulmonary tuberculosis. The gross manifestations of disease caused by the tubercle bacilli in wild mammals may be confused with lesions caused by the various forms of pseudo-tuberculosis, caseous lymphadenitis, or with mycotic ulceration and deposits in mammals. Tuberculous deposits in the viscera of birds or reptiles are sometimes quite indistinguishable from mycosis except by microscopic examination after Ziehl-Neelsen staining. Moreover, in birds and reptiles mycotic and tuberculous lesions may co-exist and can be demonstrated by the appropriate staining technique for moulds and for tubercle bacilli. In

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reptiles caseous helminth cysts may require microscopic examination to distinguish them from tubercles. In wild animals it is seldom possible to correlate tuberculous lesions found after death with any recognisable symptoms to which they may have given rise during life. Diagnosis depends upon microscopical examination of the lesions after death.

Tuberculous lesions in apes and monkeys as regards their pathologic anatomy and morbid histology are indistinguishable from those with which we are familiar in the lungs, intestines and lymphatic system of the young human subject.

In the primates the primary focus of infection undoubtedly occurs most frequently in the lungs, but whether the portal of entry is pulmonary or intestinal, the disease is invariably fatal in apes and monkeys, and so rapidly becomes generalised that it may be impossible to determine the original focus of infection.

Dr. Harold H. Scott, my predecessor in the pathological department of the London Zoological Gardens, published in 1930 an exhaustive comparative study of tuberculosis in man and the lower animals in which is embodied an anatomical paper by Scott and Beattie.[6] I will continue, therefore, with a few observations gathered from my own experience and study.

Just as the various manifestations of tuberculosis in apes and monkeys are almost identical in their pathologic anatomy and histology with those found in the human subject, so in the Bovidæ and Suidæ the lesions found in captive wild oxen, deer, antelope and swine closely resemble in character and localisation those described as commonly occurring in their respective domesticated representatives.

Tuberculosis of the uterus is not uncommon in domestic cattle and in captive wild Bovidæ, but I have not yet seen a case of congenital tuberculosis in a wild animal, though congenital tuberculosis of domestic calves is known to occur.

Tuberculosis in captive wild Bovidæ and swine can sometimes be diagnosed during life by the appearance of firm nodular tumours behind the angle of the mandible due to tuberculous enlargement of pharyngeal and cervical lymph glands, which soon break down and discharge through external sinuses. Infected animals should be destroyed and their carcases burnt as soon as the disease is diagnosed.

In tuberculosis of wild Canidæ the pericardium is nearly always seriously affected and distended with large quantities of serous or purulent exudate in which tubercle bacilli are easily detected. Hydrothorax and ascites are also common complications in this family carnivora.

The microscopic structures of the tubercle in different orders of mammals varies so little that in a mixed assortment of histological preparations from the mammalia it would be difficult to distinguish between human tubercles and those from other representatives of mammalian families. It may be stated, however, that bovine tubercles are strongly constructed and usually show a more dense accumulation of histiocytes. The giant-cell system is common to all infected mammals that I have examined.

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Bland Sutton, conducting pathological work in the London Zoological Gardens in 1881, was the first to bring avian tuberculosis under the notice of British pathologists. He diagnosed the disease in the Zoo on the naked-eye features of the lesions, and his diagnosis was confirmed in 1883 by his colleague Dr. Gibbs, who was skilled in the bacteriological technique of those days.

The *Bacillus tuberculosis avium* as seen in the tissues of birds is usually more slender and shorter; it is very variable, however, and sometimes quite long filamentous forms are observed. It tends, like the leprosy bacillus, to form dense clusters within the cells, and perhaps the most constant and striking feature in the distribution of avian bacilli is their partiality for the spleen, which they often convert into a large nodular or caseating tuberculoma in which no particle of splenic tissue can be recognised. Moreover, it is remarkable that birds of fine plumage, paradisea and equally gorgeous pheasants will die in extreme emaciation from generalised tuberculosis in the full beauty and colour of their resplendent nuptial plumes.

The liver and kidneys of birds are not infrequently destroyed by tubercles. When the kidneys are infected, the urinary tubules are found distended with masses of tubercle bacilli, in which case there is ample reason to believe that conjugal infection occurs between cocks and hens occupying the same run. Tuberculosis of the ovary is frequent, especially among ducks and other water-fowl; for instance, a gallinule (*Porphyrula martinicus*), a kind of water-hen, died from pressure effects of an ovarian tumour the size of a hen's egg. On section the tumour was found to be an overgrown and inspissated egg yolk in which masses of tubercle bacilli in pure culture were growing in a natural egg medium! The only other lesions were a few miliary tubercles in the spleen. A particularly virulent form of intestinal tuberculosis occurs among gallinaceous birds in which an acute hæmorrhagic enteritis is the only lesion visible to the naked eye. Microscopical examination of a smear of the intestinal contents reveal what appear to be a pure culture of tubercle bacilli. Sections of the gut show colonies of bacilli in the solitary follicles and the epithelial cells of the mucosa packed with acid-fast bacilli. Such cases are a great danger in the poultry-run or aviary, since in birds the intestinal mucosa is the most common portal of infection whereby the tubercle bacilli can enter and leave no trace. Once in the venous circulation, the bacilli colonise in the liver and spleen, which are quickly destroyed by an agglomeration of tubercles.

In respiratory tuberculosis of birds it is not uncommon to find the disease localised in the trachea and syrinx, the mucosa of which is destroyed and replaced by a caseous exudate swarming with acid-fast bacilli in pure culture. In such cases the lymph channels along each side of the bird's neck may form a chain of enlarged tuberculous lymph nodes homologous to the chain of enlarged tuberculous cervical glands met with in certain cases of tuberculosis in mammals. The histological feature of the avian tubercle is rapid centrifugal extension of the growth of epitheloid cells, the intracellular concentration of the bacilli in

this area, and the early and advancing necrosis of the interior of the tuberculous focus. Giant cells are generally absent, and if present are not characteristic, since they occur also around mycotic foci in birds. In the muscles of birds, and sometimes in their air sacs or lungs, the tubercles may be enclosed in a fibrous capsule, but in the latter situation pulmonary gangrene is more frequent.

Reptilian and amphibian tuberculosis may be pulmonary, alimentary or generalised. The bacilli vary greatly in length and breadth; some are long, stout and filamentous-like leptothrix threads, others are short, slender, segmented and approximately more towards the avian type of bacilli. Crocodiles, lizards, snakes and frogs are affected in about equal proportions.

The lesions in alimentary infections are intestinal ulceration and hard dense tuberculous nodules in the submucosa, mesentery, liver and spleen. If the lungs are affected, the tubercles are usually soft and caseous; but in the tissue immediately adjacent to the lung, hard nodular tubercles are found. Reptilian and amphibian tubercles are usually enclosed in a capsule of fibrous tissue, soft and œdematous in pulmonary lesions, firm and dense elsewhere. They all show central necrosis, but no giant cells. They are indistinguishable from mycetomatous deposits except by appropriate staining and microscopical examination.

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A CASE OF AORTIC RUPTURE AS A RESULT OF ACUTE MYOCARDITIS.

By HAROLD BERTHELSEN,

Report from the Pathological Anatomy Department of the Veterinary College in Stockholm. Director, Professor A. Hjärre.

In animals and men heart ruptures are met with as traumatic and spontaneous. The traumatic ones arise from direct violence (for instance stab, shot and the like) or indirect violence (downfall, strenuous exertion, throwing and the like).

In the spontaneous heart ruptures either a *locus minoris resistentiæ* in the wall is met with or no cause can be proved. The direct traumatic ones form a well limited group, and so I will altogether leave them out of consideration. The limit between indirectly traumatic heart ruptures and spontaneous ones is often difficult to determine (Ackerknecht, Hjärre and Bergström). Spontaneous ruptures in wholly sound myocardium only occasionally occur in the horse. It is more common to meet with ruptures as a result of a *locus minoris resistentiæ* in the

myocardium with indirect injury as the exciting cause. (Ackernecht, Hjärre and Bergström). As far as man is concerned this same holds good, according to Mönckenberg.

The weak points in the wall may arise from degenerations, myomalacias, abscesses, aneurisms, senile dilatations, parasitic injuries ; and, as far as man is concerned, above all from circulatory disturbances in the coronary vessels (Mönckenberg, Buckley, Meyer). It is from the last cause the great number of heart ruptures in old men are partly explained.

As for the situation, ruptures in the horse are found most frequently in the right ventricle, also in the wall of the right and of the left auricles (Leonhardt, Ackerknecht, Hjärre and Bergström). Ruptures of the left ventricle, and especially in its lower part, seem to be rare, contrary to the case in man (Ackerknecht, Mönckenberg). Septum ruptures seem to be still more rare in the horse. I have only succeded in finding one instance in the literature ; and this one is mentioned but not described by Leonhardt.

Ruptures of the big vessel trunks in the immediate proximity of the heart are not rare in the horse. They are mostly found on the aorta immediately behind the semilunar valves.

Here I will describe a case of heart rupture in the horse with a peculiar combination of septum and aorta rupture, arising from a purulent myocarditis with an indirect injury as the exciting cause.

Brown saddle-horse, 19 years old, belonging to the 7th Artillery Regiment. The horse had been sent out on contract for a time without showing signs of disease. On July 26th, 1934, it had been allowed to swim a short distanced and afterwards it was suddenly taken ill. It was standing listlessly, with its head supported against the wall, and was sweating. Later on in the day there was a change for the better. A veterinary surgeon was consulted on the telephone. As he suspected colic, he ordered lactic acid and moving about. On the next day the horse fell very ill and died before a veterinary surgeon had time to come to the place.

Post-mortem examination 28/7 (0.354/34).

Autopsy.—Acute, purulent myocarditis with principal site in the septum between the ventricles. Parietal ulcerated endocarditis ; heart rupture ; aortic rupture ; hæmorrhage with rupture of the pericardium ; hæmorrhage into the thorax ; ascites ; hyperemia and œdema of the lungs ; aortic aneurism (abdominal aorta) ; thyroid cyst ; cholesteatoma in the vessel plexus of the brain ; traumatic wounds in the mouth.

The main point of the post-mortem is the changes of the heart, and a more detailed description of these will therefore be given. The pleural sacs contain each about 2½ litres of blood. The pericardium contains about 100 c.c. blood, and at its attachment at the sternum some small, pervading ruptures are found. Around the ruptures and further on at a few other places in the pericardium there were diffuse bleedings. On the epicardium there were numerous thin, fibrinous coatings and

under the epicardium numerous petechiæ and ecchymoses. The last-mentioned were especially found around the coronary vessels. On the upper surface at the base of the aorta there was a subserous hematoma as large as the flat of a hand. In its serous covering there were a few small ruptures. The heart showed no noticeable changes of size or volume. Under the septum and tricuspid valve on an area about the size of a half-crown up to ½ cm. thick, fresh thrombic coatings were found. Under these the upper part of the septum is the seat of an about 5 cm. long fusiform body which has an oval-shaped cross incision (Fig. 1). From the right ventricle a perforation canal leads through the former part to the sinus of Valsalva (Fig. 2). The canal permits passage of a 1 cm. thick glass rod, and has edges covered by fibrinous deposits. The rupture in the aorta is angular, with the points of the angle turned dorsally. The legs of the angle are about 2 cm. long. The myocardium is of a somewhat tender consistence and an inflamed aspect, with alternating grey and grey-red parts. The coronary vessels appear normal.

As being of further importance to the autopsy, I also noticed a moderate hyperemia of the lungs with œdema, a considerable spleen enlargement (about three times as big as a normal one), a slight liver enlargement, ascites (about 1½ litre of red-coloured exudate), and some stasis, with œdema, in the small and large intestine.

Microscopical examination.—The myocardium around the septum rupture shows the picture of an intensively purulent myocarditis. Nearest to the rupture slit there is a rather thick fibrinous stratum without any signs of organisation. Then follows in the peripheral direction an area with considerable infiltration of polymorphonuclear leukocytes, lymphocytes and some eosinophilia, mixed up with remains of heart muscle cells. Further, peripherally one notices alternative processes in the myocardium in the form of parenchymatous degeneration, here and there combined with finely grained fat degeneration, and a moderate interstitial leukocyte infiltration combined with œdema. The tissue in the inflamed parts is partly intact; partly there can here and there be found small albuminous degenerative areas with a slight interstitial leukocyte infiltration. Fat is only scantily found here in finely grained form in some degenerative cells. Parts of the right main trunk of the myogenic conduction system show in the proximity a remarkable homogenesis, and are surrounded by a rather considerable inflammatory cell reaction. An incision of the left main trunk was examined a little below the middle of the septum. It showed here a moderate fat infiltration and seemed to be somewhat granular.

Microscopically no sign of thrombus formation was found in the smaller vessels.

No bacteria were found in the thrombus nor yet in the myocarditis, neither in the smear nor on cultivation. Nor in sections from the myocardiac area could bacteria be detected.

In this case the parietal ulcerous endocarditis in the tricuspid valve may have

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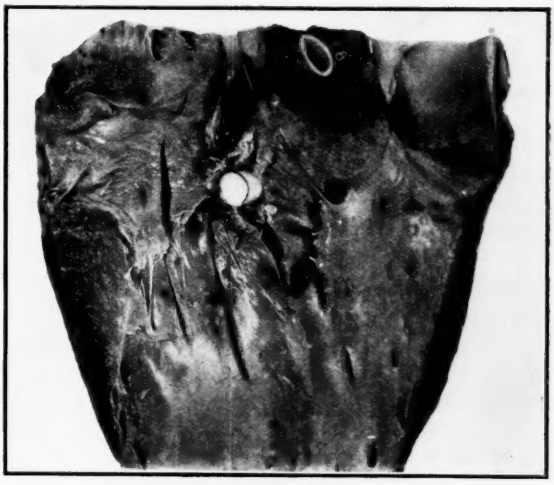

FIG. 1.—Case of aortic rupture as the result of acute myocarditis.

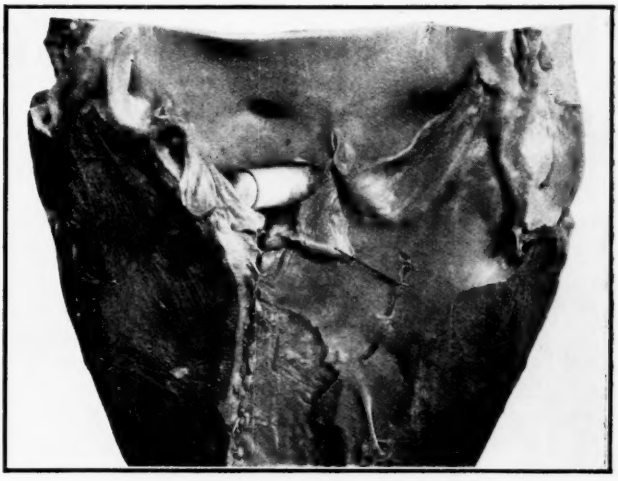

FIG. 2.—Showing perforation canal leading to the sinus of Valsalva.

(*Article by* Harold Berthelsen, *page* 362)

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been the original lesion. It was tolerably fresh and no cause could be proved. Secondary to this one a myocarditis in the septum might have arisen. The localisation of the endocarditis on the underside of the ventricular valve, and the intimate connection between it and the changed septum myocardium, makes a transference most probable. The most common case is that an endocarditis *via* the coronary vessels produces a myocarditis. Such a possibility cannot be wholly eliminated in this case, but most probably there is a transference effected. It is, however, not out of the question that the myocarditis was the original lesion, and the endocarditis secondary. If this is the case a transference is surely most probable.

When one considers the conditions in man one might think that a circulatory disturbance in the coronary vessels would be the primary cause, having in its wake inflammatory reactive processes. I have, however, not been able to prove such changes of the vessels in this case. And in the horse, changes of the coronary vessels are, moreover, not at all as common as in man. Such an explanation is therefore not very feasible.

Somehow or other through the myocardium changes a *locus minoris resistentiæ* has arisen. Through the exertion during the swimming interval the heart has been pressed above the breaking point, and the ruptures in the septum and the aorta, with ensuing pathological and anatomical changes, have arisen.

To explain the end of the case in the sequel, it seems to me as if one must principally consider :

The myocarditis at the seat of the rupture in the septum is of such a degree and extent that the efficiency of the heart has been considerably impaired. Its situation predisposes it for injuries as the head trunk of the muscular conduction system. I have not examined it in its entirety, as the organ is in preparation for the museum. I have, however, pointed out certain changes in parts of the right and of the left trunk. I know how very difficult it is to estimate the functional effect of these changes (Ackerknecht, Joest, Schminke). However, one should draw attention to, firstly, the inflammatory processes in the proximity of parts of the right trunk ; secondly, the considerable myocardiac changes in immediate proximity of the central parts of the conduction system ; thirdly, the toxic influence on the conduction system in an essential degree will have impaired the efficiency of the heart.

The circulation disturbance through the internal rupture.—Great importance can hardly be attached hereto. I cannot give a reference to any experiment, but it is well known that animals are able to live for a long time with congenital septum defects without any clinical signs of circulation disturbances (Lilleengen).

The parietal endocarditis in the tricuspid valve.—Except for the above mentioned importance as a possible primary seat of affection it has surely only played a part in the beginning of the comparatively less important stasis phenomenæ.

The bleeding via the periaortal hematoma.—Through the seat of the rupture conditions for a periaortal bleeding have been present, and through the ruptures

in the serous coat there is also an explanation of the hæmorrhages of the pericardium. Provided that the pericardium is unruptured we have then also conditions for a heart blockage. In this case the pericardium had burst at the obstruction. The rupture can have been agonal, but the bleedings around the lips of the rupture and the rather large amount of blood in the pleural sacs suggest an internal rupture. The loss of blood through the internal bleeding had also contributed to debilitating the animal.

The cause of death is then, lastly, heart insufficiency, caused by a myocarditis with septum and aortic rupture.

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BRITISH MEDICAL ASSOCIATION.

AT the Annual Representative Meeting, held July 22nd, 1935, the subject of the " One-Portal " Entry was discussed :

Dr. J. S. Manson asked the Representative Body to reaffirm the early policy of the Association regarding " one-portal " entry to the medical profession. It was at the first Representative Meeting, held under the new constitution of the Association in 1903, that this policy was adopted. A new generation of practitioners had arisen with no knowledge of that early policy. At the present Representative Meeting there were only two who were present on that occasion thirty-two years ago—Dr. Langdon-Brown and Dr. D. F. Todd. The Medico-Political Committee of that day was instructed to proceed to draft a Bill—whether it was ever introduced into Parliament he did not know—which formulated in a legal manner the policy of the Association of that day. The committee had Sir Victor Horsley as its chairman, and contained many members of distinction. The point of the Bill was that a uniform final examination for the whole country should be held in various centres. But to-day there was a larger number of licensing bodies than ever before, and the variability of their standards was suggested by the fact that an investigation showed that the percentage of

passes varied from fifty in one case to eighty in another. If this " one-portal " policy were adopted it would bring the medical profession into line with other professions.

Dr. E. H. T. Nash felt that it was most unfortunate that a resolution of this importance should come on at the very end of a weary meeting. The best thing to be done was to put it in a prominent place in next year's agenda.

Sir Henry Brackenbury said that he, too, objected to the resolution coming on in this way, but he was entirely against its postponement till next year. He deprecated the use of the valuable time of the Representative Body in discussing abstract resolutions which had no practical value. It was true this policy stood on the books of the Association ; a great many resolutions which had become of no importance stood on their books. But he could assure the meeting that as a means towards any practical steps which could be taken in this direction just now this motion was valueless. He opposed it also on principle. It would be a retrograde step in the light of modern educational principles and modern medical thought. Dr. Manson had said that they were now proposing the standardisation of the curriculum ; that was exactly what they were not proposing. The Medical Education Committee said in its report : " It is desirable to allow, even to encourage, a wide liberty of choice in different schools, provided that certain broad general requirements are satisfied." Sir Norman Walker, President of the General Medical Council, said at the recent May session : " It is not possible to frame a model curriculum which will suit every school in the country, and no hard-and-fast arrangement of subjects is possible, even if desirable." It was a commonplace nowadays to talk of the " tyranny of examinations," and if one uniform examination was to be imposed for entrance on the Medical Register the teaching in all the medical schools would become directed to the necessity of passing that examination. It would mean a tendency towards, if not the imposition of, a uniform curriculum, a uniform method of teaching, with a uniform stile to be got over at the end of that teaching. That was contrary to everything that was reckoned good in the educational world, and he wanted to suggest that it ought not to be imposed upon the world of medicine.

The Chairman of Council took up the protest which had been made about the place on the agenda at which this resolution came. Those concerned were warned of what would happen, but they decided to have the resolution at this point appended to the report of the Medical Education Committee instead of where it was set out originally, among the independent motions from Divisions and Branches. It was not the fault of the Agenda Committee.

Dr. Manson said that the motion was not brought forward for dialectical exercise. If the other professions found a " one-portal " entry useful it meant that the medical profession was out of step with the rest.

The Warrington motion was lost by a large majority.

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Clinical Articles

Unusual Cause of Urethral Hæmorrhage.

By L. J. KELLY, F.R.C.V.S.
Worthing.

THE patient, a pedigree male dog, two years old, was brought with the history of occasional hæmorrhage after urination during the previous two days. Upon examination of the urethra I noticed a small hair-like body just protruding from the orifice, and upon applying gentle traction with forceps to this I withdrew an awn of barley grass. Although I could get no direct confirming history, I presume that it gained access on some occasion when the dog was rubbing along the grass, and it illustrates the importance of always making a careful clinical examination before giving an opinion.

Abstracts of Current Literature

Intoxications of Vegetable Origin. BY A. HENRY. (*Continued from page* 322.)

Two of the principal species which cause trouble are *Astragalus Mollisimus* and *oxytropis lamberti*, two papillionacæ of North America. But as we have in our flora several species of Astragalus, it may perhaps be useful to know the symptoms caused by these weeds in the United States. Horses are chiefly involved; but the ox and the sheep may be equally affected. The effects are produced slowly as in lathyrism; in the symptoms, two phases are noticeable. In the first, which may last several months, there are hallucinations, all sorts of bad habits, with alternations of stupor: vision is greatly impaired. The Astragals generally have a sweetish sugary taste: the animals take a liking to these plants, and as in man in intoxications by alcohol, tobacco and morphine, they come no longer to desire any other food. In a second stage progressive emaciation occurs: the animals remain immobile; the coat staring; the eyes are dull; death comes slowly; the subjects drag themselves about for several months. In certain sectors of the United States where *loco-diseases* arise, the losses amount to hundreds of thousands of dollars. The active principle is not yet well defined. Marsh and Crawford seem to consider that the effects will be due to the presence of barium in the plant.

Galega.—The *galega officinalis* or rue of goats has sometimes been vaunted as forage; but in reality animals hardly touch it; it is, besides, very quickly toxic for the sheep.

It contains *galegine* isolated by G. Tanret; it is a derivative of guanidine which has hypoglycæmic properties.

Melilots.—These are plants containing *coumarine*; accidents from these are rare in France, but in India a Melilot malady has been characterised by hæmorrhages and suffusions of blood denoting a modification of coagulability of the blood.

Cassia occidentalis.—Finally to terminate this long series of toxic Leguminosæ I would mention the seeds of *cassia occidentalis* which, fraudulently mixed with oats, have on two occasions caused great losses in horses in the Paris region. On account of certain nervous disturbances which often accompany accidents, one was led to believe that there was a veritable epizootic of encephalitis; but it was soon observed that the accidents were consecutive to the ingestion of certain oats containing seeds of *cassia occidentalis* which had been fraudulently added. The accidents are very characteristic: at first there is dejection and somnolence; at times the animal wakes up and tries to masticate some food, which falls out again; the buccal mucosa is dry, the ocular mucosa red or saffron coloured, sometimes petechial; the pulse is normal or slowed, respiration normal, temperature normal or slightly raised. The gait is quite uncertain. The droppings are scarce and hard. The urine is darkened and rather sparse. Mastication and deglutition are more or less difficult; prehension of liquids is almost impossible.

Then intermittently crises appear. The subject at first presses on the wall. If at liberty it walks ahead without avoiding obstacles. Periods of remission follow the periods of crises; then the crises recur without intermission and death is the rule. When the animals have refused the oats or only consumed a small quantity, cure results in 15 to 20 days, otherwise death occurs in 12 to 15 days. Almost similar accidents may be produced in the horse by Soya beans.

(*To be continued*).

Reviews

City of Belfast.—CITY VETERINARIANS' REPORT FOR YEAR 1934.

THE report of the Belfast City Veterinarians falls into the category of those which are included in the report of the Medical Officers of Health, but full credit is given, to the work of Capt. McLean. Dr. Thomson has been a good friend to veterinarians and has lately successfully supported the appointment of Capt. McLean as Superintendent of Public Abattoirs. The veterinary profession fully appreciates that support.

Animals Killed in the Public Abattoirs.—Cows, 20,622; heifers, 1,056; bulls, 1,215; bullocks, 18,117; calves, 2,174; sheep, 62,132; lambs, 51,819; goats, 1,427; pigs, 9,882; total, 168,484. These figures show a reduction of 529 sheep, but an increase of 2,226 cattle, 4,762 pigs, and 116 goats compared with the figures

for the previous year. Seven hundred and fifty-two carcases, or 0.4 per cent., were rejected as unfit for human food.

Tuberculosis.—This disease was the cause of 48 per cent. of all rejections, and it is interesting to note that these figures show a reduction of 16 per cent. compared with those for the 1933 period. The following table is instructive :

BY AGE.

Species	1 month to 1 year	Per cent.	1 to 3 years	Per cent.	3 to 6 years	Per cent.	Over 6 years	Per cent.
Cows	—	—	—	—	—	—	318	100
Heifers ...	—	—	2	66	1	33	—	—
Bullocks ...	—	—	4	22	14	77	—	—
Bulls	—	—	1	33	1	33	1	33
Pigs	24	100	—	—	—	—	—	—
Calves ...	2	100	—	—	—	—	—	—

It would be interesting to know next year the approximate ages of all T.B. cows over six years, because it has long been the opinion of many observers that all cows over a certain age limit should be disposed of for economical and disease reasons. A table given showing the condition of the affected animals is instructive as evidence that the apparent condition of animals is of no value as to the extent to which they may be affected with tuberculosis. This has long been urged by butchers as unfair trading because a buyer may in good faith purchase for a high price a healthy looking animal and after slaughter find it extensively diseased.

Distomatosis.—The livers of Irish animals are well known to butchers as being heavily infected with flukes. The report under consideration confirms this. The percentage of livers affected by this parasite was twenty-two in cattle and six in sheep, causing a loss to butchers of nearly £3,000. It would, as the report suggests, be advisable and profitable to eliminate this disease from animals, and we respectfully suggest the veterinary department of the Ministry of Agriculture of Northern Ireland consider the matter.

Inspection of Country Killed Meat.—All meat imported into the City of Belfast must be brought for examination to the public abattoir. This is a part safeguard against diseased meat entering the city, but it is far from being complete security. The examination of eviscerated carcases and organs identifiable as to the carcases from which they were derived is always unsatisfactory. The only place where meat inspection can be satisfactorily performed is at the time and place of slaughter, when the organs and carcases can be identified as associated, and the passed meat stamped, so that it can be accepted, subject to check inspection in any district. This cannot be urged too strongly. The detection of one case of anthrax amongst the meat brought in from the country emphasises this opinion, as valuable lives might have been lost.

Handling and Transport of Food.—The report states improvements have been effected, but we are yet still far from the ideal method. The Public Health (Meat) Regulations, 1924, for England might form a useful basis for Irish legislation on this subject.

Cows and Cow Sheds.—Cow sheds, 74 ; cows, 1,037 ; cows found affected with tuberculosis, 4.

In the report on udder lesions there appear the words : " In the majority of cases dealt with the lesion was of streptococcic origin. This organism, although regarded as non-pathogenic to man . . . " We would remark that this opinion is disputed

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by many observers, and the organism regarded as the cause of various conditions in human beings.

Electrical Stunning.—All sheep, goats, pigs and calves are stunned by this method, and so satisfactorily that members of the butchering trade would not go back to the old method of slaughter. The report shows evidence of careful observation and reflects credit on the City Veterinarian.

J. D. YOUNG.

News

THE VALUABLE INFLUENCE OF THE N.V.M.A.
Vis Unita Fortior.

A PROTEST against professional associations' interference with the payment of County Council officials was recently made by Mr. W. S. Lane at Worcester County Council, when it was announced that the National Veterinary Association had refused to insert the Council's advertisement for a county veterinary officer in its professional journal as the salary offered (£500 a year) was below that recommended by the association for such an appointment. Mr. Lane was speaking against a suggestion by the Public Health and Housing Committee that the post should be readvertised at £600, rising to £700. The sub-committee reported, in support of this recommendation, that the association's ban had resulted in very few suitable applications being received for the post.

Mr. Lane said the sub-committee was asking the Council to place itself in a contemptible position. It had been blocked from making the appointment by outside dictation, although the figure offered was only as an initial salary.

Mr. C. Terry said no one liked interference from outside, but the Council should not spite themselves because of it. If the selection was so limited, he did not consider it was losing dignity to offer the money necessary to get suitable applications.

Mr. J. Davis said a great many first-class veterinary surgeons would jump at the figure of £500 if they dared go outside their association.

The amendment was lost, and the recommendation to advertise again carried. —*Birmingham Weekly Post.*

VETERINARY OFFICER TO THE OXFORDSHIRE COUNTY COUNCIL.

THE special sub-Committee to inquire into the proposed appointment of a full-time veterinary officer recommended that one full-time veterinary officer be appointed, and that the salary be from £500 to £600 per annum, according to experience; that travelling expenses in accordance with the Council's scale be allowed to him while using a car on Council business. The Chairman said the sub-Committee had also considered the question of the future policy of the Council in relation to the administra- of the Diseases of Animals Acts and Orders, and the Acts and Orders regulating the supply of milk. "Your sub-Committee felt that, ideally speaking, the Agricultural Committee should be the advisory body so far as the farmers are concerned," he added. "They should be in the position of the farmers' friend to give advice and to guide the farmers; but with regard to the actual inspection in connection with grade A supply and any other matters in connection with the diseases of animals, that the policing

work should be on the Public Health Committee. The scheme entails quite a substantial additional expenditure, but we were at great pains to try and keep that expenditure as moderate as we could for the time being." The recommendation was approved. —*Oxford Mail.*

Personal

OLD Indian students of the Royal Veterinary College will congratulate Mr. H. L. Bhandari, M.R.C.V.S., upon being amongst the first to receive a commission as Lieutenant in the Indian Army Veterinary Corps. Mr. Bhandari has been stationed for duty at the Military Veterinary Hospital, Peshawar.

MR. W. H. JEBSON, V.S., of Pocklington, Yorkshire, a very much respected member of the "Existing Practitioners" list, has passed away at the age of seventy-five. The funeral service at the Trinity Methodist Church, Pocklington, and the interment in the Bishop Wilton Churchyard, was attended by more than 300 mourners from amongst the farmers and cattle dealers of the Wolds and the North and West Ridings of Yorkshire desirous of showing their respect. Mr. Jebson had practised in Pocklington for over fifty years, and will be much missed by a very large *clientèle*.

MR. H. M. SALISBURY, M.R.C.V.S., D.V.H., assistant veterinary officer to the West Riding of Yorkshire, has been appointed Chief Veterinary Officer for the City of Sheffield, in succession to Capt. Wm. Tweed, who has taken up an appointment in Somerset. Mr. Salisbury was formerly in the Colonial Service in Tanganyika, and is a graduate from the Liverpool University Veterinary School.

COLONEL DUNLOP YOUNG, Veterinary Adviser in Britain to the Canadian Government, is, on the invitation of the Minister of Agriculture, about to make an advisory tour of the Dominion. He sailed on the *Empress of Britain* on August 24th.

ERRATA.

THE VETERINARY JOURNAL, page 316 (July, 1935), line 15—"ol. picris" should read "ol. picis"; line 27—"Mr. W. Mackson Young" should read "Mr. W. Jackson Young."

Publishers' Notices

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